PHYSICS ABSTRACTS

SECTION A

of

SCIENCE ABSTRACTS

SECTION A, PHYSICS
SECTION B, ELECTRICAL ENGINEERING

VOL. 54
1951

Edited and Issued by

THE INSTITUTION OF ELECTRICAL ENGINEERS
SAVOY PLACE, LONDON, W.C.2

In Association with

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CONTENTS

(The figures after entries refer to page numbers)

Abstractors	v
Errata	vii
Supplement to List of Journals	viii
Supplement to List of Abstracting Journals	xii
Note on the Universal Decimal Classification System	xii
Author Index	1161
Subject Index	1311
Collected List of Subject Index Headings	1455

51	MATHEMATICS	1, 89, 177, 265, 377, 465, 577, 689, 769, 865, 981, 1077
52	ASTRONOMY. ASTROPHYSICS. GEODESY	3, 90, 178, 266, 379, 466, 578, 689, 769, 866, 982, 1077
53	PHYSICS	8, 94, 181, 273, 384, 469, 584, 694, 774, 871, 989, 1080
530.1	Fundamentals	8, 94, 182, 273, 384, 469, 584, 694, 774, 872, 989, 1081
531	General mechanics. Mechanics of solids	12, 185, 278, 387, 475, 593, 696, 780, 879, 994, 1084
531.7	Mechanical measurements	13, 97, 186, 278, 388, 475, 593, 697, 780, 880, 994, 1084
532	Mechanics of fluids	13, 98, 186, 279, 389, 477, 594, 698, 781, 881, 995, 1085
532.6	Capillarity	14, 99, 280, 391, 596, 699, 882, 996, 1087
532.7	Molecular theory of liquids	14, 100, 188, 281, 392, 478, 596, 699, 782, 883, 997, 1087
533	Mechanics of gases	15, 100, 189, 282, 393, 479, 597, 700, 782, 883, 998, 1088
533.7	Molecular theory of gases	102, 190, 285, 394, 481, 598, 701, 783, 885, 1000, 1091
534	Vibrations. Acoustics	18, 102, 190, 285, 395, 481, 598, 701, 784, 886, 1001, 1091
535	Optics. Radiation. Spectra	21, 104, 196, 288, 397, 486, 605, 702, 787, 888, 1004, 1093
536	Heat	30, 114, 205, 300, 403, 498, 618, 710, 798, 906, 1012, 1099
536.7/.8	Thermodynamics	32, 116, 208, 305, 501, 621, 712, 799, 909, 1016, 1101
537	Electricity	34, 116, 208, 305, 501, 621, 713, 800, 909, 1017, 1102
537.1	Theory. Electrons	208, 305, 501, 621, 713, 1017
537.2	Electrostatics. Dielectrics	34, 116, 209, 306, 406, 501, 622, 713, 800, 909, 1017, 1102
537.3	Electric conduction. Currents	36, 118, 209, 309, 408, 503, 624, 715, 802, 911, 1019, 1104
537.52	Electric discharges	40, 121, 214, 312, 410, 506, 627, 719, 807, 921, 1022, 1110
537.531	X-rays	42, 123, 215, 314, 412, 508, 630, 722, 810, 923, 1024, 1111
537.533/.534	Cathode rays. Positive rays	43, 124, 215, 314, 413, 509, 630, 722, 810, 924, 1024, 1112
537.54	Discharge tubes. Counters	45, 126, 216, 319, 415, 513, 634, 724, 813, 927, 1027, 1114
537.56/.58	Ionization. Thermionics	46, 128, 217, 320, 417, 515, 635, 726, 815, 929, 1029, 1116
537.591	Cosmic rays	47, 130, 218, 320, 417, 515, 637, 727, 816, 930, 1029, 1118
538	Magnetism	55, 132, 221, 325, 420, 519, 641, 728, 817, 934, 1032, 1120
538.3/.5	Electromagnetism. Electrodynamics	58, 135, 224, 328, 423, 522, 645, 733, 823, 938, 1034, 1123
538.56	Electromagnetic waves and oscillators	58, 136, 224, 328, 423, 522, 645, 733, 823, 938, 1034, 1123
538.6	Magnetic effects	59, 137, 225, 332, 426, 525, 648, 735, 827, 940, 1036, 1125
539.1	Molecular and atomic structure	226, 332, 426, 526, 649, 735, 828, 942, 1036, 1125
539.11	Theory of solid state	137, 226, 332, 426, 526, 649, 735, 828, 942, 1036, 1125
539.13	Molecular structure	60, 138, 226, 333, 427, 527, 650, 735, 828, 942, 1037, 1126
539.15	Atomic structure. Nucleus. Isotopes	61, 139, 227, 335, 429, 529, 652, 737, 832, 945, 1038, 1127
539.16	Radioactivity. α-, β- and γ-rays	64, 142, 229, 339, 431, 533, 655, 738, 835, 948, 1041, 1128
539.17	Nuclear reactions	67, 145, 233, 345, 435, 539, 660, 743, 841, 951, 1045, 1131
539.18	Atom and molecule beams. Mesons. Neutrons	71, 147, 237, 349, 438, 547, 667, 745, 845, 956, 1048, 1135
539.2	Structure of solids	73, 149, 238, 351, 439, 549, 669, 746, 846, 958, 1050, 1137
539.3/.8	Elasticity. Strength. Rheology	75, 152, 239, 354, 440, 551, 670, 748, 848, 960, 1052, 1138
541	PHYSICAL CHEMISTRY	78, 155, 243, 357, 445, 554, 673, 751, 850, 963, 1054, 1140
541.11/.12	Phase equilibrium. Chemical reactions	78, 155, 243, 357, 445, 554, 673, 751, 850, 963, 1054, 1140
541.13	Electrochemistry	78, 161, 245, 362, 446, 557, 674, 752, 851, 965, 1057, 1142
541.14/.15	Photochemistry. Radiation chemistry	79, 162, 245, 363, 447, 557, 675, 753, 852, 966, 1058, 1142
541.18	Dispersions. Colloids. Adsorption	80, 162, 246, 364, 447, 557, 677, 753, 853, 967, 1059, 1144
541.4/.6	Chemical structure	81, 164, 247, 365, 449, 560, 678, 754, 853, 968, 1062, 1146
542.1/.7	Laboratory apparatus	165, 247, 561, 969, 1063
543/545	Chemical analysis	82, 165, 248, 367, 449, 561, 679, 755, 854, 969, 1063, 1146
548	CRYSTALLOGRAPHY	82, 166, 249, 368, 451, 563, 680, 755, 854, 970, 1065, 1147
548.7	Molecular and X-ray crystallography	84, 168, 249, 369, 451, 564, 681, 756, 855, 971, 1066, 1148
55	GEOPHYSICS	85, 171, 253, 371, 455, 565, 684, 760, 858, 974, 1071, 1151
551.5	Atmosphere. Meteorology	85, 173, 253, 373, 457, 566, 684, 762, 859, 975, 1073, 1152
57/59	BIOLOGY	87, 175, 258, 375, 462, 571, 685, 766, 862, 976, 1076, 1155
61	Medical science. Human physiology	87, 175, 258, 371, 462, 571, 685, 767, 862, 976, 1076, 1155
66/67	TECHNICAL MATERIALS	88, 175, 261, 863, 979, 1158
77	PHOTOGRAPHY	88, 176, 262, 375, 463, 575, 687, 768, 868, 979, 1076, 1158

46150

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ERRATA, 1950

Abstr. 1412, 1420, 1421, 2169: *for* journal reference read *Publ. Dom. Astrophys. Obs., Victoria, B.C.*
Abstr. 2525, line 2: *for* F. de la Ripelle *read* M. Fabre de la Ripelle.
Abstr. 3705, line 2: *for* H. M. Stainer *read* H. M. Stanier.
Abstr. 7689, line 3: *for* (1949) *read* (1948).
Abstr. 7742, line 2: *for* "constants" *read* "quantities."
lines 12, 14: *for* "effect" *read* "action."
Abstr. 8737, line 4: *for* (*Jan.*, 1950) *read* (*Jan.*, 1949).
Author Index, p. 1069, column 1; Bleksley, A. E. H.: *for* 7961 *read* 7691.
Author Index, p. 1141, column 1: *for* Millar, A. R. *read* Miller, A. R.
Author Index, p. 1154; Prasad, M., Dharmatti, S. S., Kanekar, C. R. and Biradar, N. S.: *for* 1869 *read* 1069.
Author Index, p. 1172, column 1: *for* Stainer, H. M. *read* Stanier, H. M.
Author Index, p. 1184: Wada, Y. Insert Wada, M. as author of entry for Abstr. 8534.

ERRATA, 1951

Abstr. 313, line 8: *equation should read* $\sigma = A \exp(-e/2KT)$.
Abstr. 394, line 3: *for* S. Chatterji *read* S. Chatterjee.
Abstr. 734, line 14: *for* "yellow" *read* "violet of the Grimberg salt, which gives a very weak Tyndall cone."
Abstr. 1218, line 2: *for* H. Kopineck *read* H.-J. Kopineck.
Abstr. 1858, line 2: *for* A. M. Prokofiev *read* A. M. Prokofev.
Abstr. 1908, line 2: *for* S. E. Belenkii *read* S. Z. Belenkiĭ.
Abstr. 2098, line 2: *for* M. F. Lashko *read* N. F. Lashko.
Abstr. 2149, line 2: *for* O. M. Bizzel *read* O. M. Bizzell.
Abstr. 2255, line 5: *insert* "For Pt I see Abstr. 770 (1951)."
Abstr. 2288, line 1: *for* **"inflammable forms of phosphorus"** *read* **"flashing phosphors."**
line 6: *for* "inflammable phosphorus" *read* "flashing phosphor."
lines 6 and 11: *for* "mercurial" *read* "mercury."
line 8: *for* "inflammable" *read* "infra-red-sensitive flashing."
line 9: *for* "forms of phosphorus" *read* "phosphors."
Abstr. 2595, line 2: *for* J. V. Ramsey *read* J. V. Ramsay.
Abstr. 2752, line 2: *for* B. D. Tazulakov *read* B. D. Tazulakhov.
Abstr. 2784, line 3: *for* H. T. Zatsepin *read* G. T. Zatsepin.
Abstr. 2841, line 2: *for* T. D. Zoton *read* T. D. Zotov.
Abstr. 2929, line 2: *for* **state** *read* **states.**
Abstr. 3103, line 6; *for* Abstr. 651 (1951) *read* Abstr. 685 (1951).
Abstr. 3278, line 2: *for* F. Whipple *read* F. L. Whipple.
Abstr. 3423, line 2: *for* J. A. Ramsay *read* J. E. Ramsey.
Abstr. 3456, line 2: *for* (*Oct.*, 1951) *read* (*Oct.*, 1950).
Abstr. 3520, line 8: *for* 6×10 V/cm *read* 6×10^2 V/cm.
Abstr. 3842, line 12: *for* 1·11 *read* 0·11.
Abstr. 4075, line 14: *for* g_{ikl} *read* $g_{ik,l}$.
Abstr. 4198, line 3: *for* A. O. Williams *read* A. O. Williams, Jr.
Abstr. 4476, line 2: *for* T. S. Needles *read* T. S. Needels.
Abstr. 4654, line 2: *for* F. D. Butement *read* F. D. S. Butement.
Abstr. 4748, line 2: *for* J. G. Gunn *read* J. C. Gunn.
Abstr. 5452, line 5: interchange "Z^4" and "Z^3".
Abstr. 5461, line 2: *for* Miyamato, G. *read* Miyamoto, G.
Abstr. 5510, line 2: *for* K. B. Tolpigo *read* K. B. Tolpygo.
Abstr. 5682, line 6: *for* "Pa ' *read* "Pd."
Abstr. 5700, lines 5 and 6 *should read* "Rb^{91} has an isomeric state (100 sec) as well as the ground state (14 min)."
Abstr. 5705, line 1: *for* I^{126*} *read* I^{126}.
Abstr. 5805, line 3: *for* H. G. Houtermans *read* F. G. Houtermans.
Abstr. 5930, line 2: *for* Gharpurey *read* Charpurey.
Abstr. 6076, line 2: *for* Kusakawa, K. *read* Kusukawa, K.
Abstr. 6124, line 2: *for* J. A. Ketelaar *read* J. A. A. Ketelaar.
Abstr. 6457, line 3: *for* J. E. Nechaj *read* J. F. Nechaj.
Abstr. 6487, line 2: *for* M. B. Yakutovich *read* M. V. Yakutovich.
Abstr. 6741, line 2: *for* M. V. S. Vrkljan *read* V. S. Vrkljan.
Abstr. 7157, line 2: *for* H. W. Linnett *read* J. W. Linnett.
Abstr. 7733, line 3: *for* (1951) *read* (1950).
Abstr. 7854, line 39: *for* 4×10^{-5} *read* 4×10^{-6}.
Abstr. 7894, lines 6 and 15: *for* $PbSO_4$ *read* PbS.
Abstr. 7895, line 5: *for* $PbSO_4$ *read* PbS.
Abstr. 8138, line 5: *for* Abstr. 3706 (1951) *read* Abstr. 7189 (1951).
Abstr. 8697, line 15: *insert* "squares of"" *before* "velocities."
Abstr. 8697, line 16: *for* $(\partial p/\partial s)_s$ *read* $(\partial p/\partial \rho)_\xi$.
for $(\partial_s/\partial\xi)_p$ *read* $(\partial s \partial\xi)_p$.
Abstr. 9427, line 9: *for* "vapour" *read* "melting."

SUPPLEMENT TO LIST OF JOURNALS

The following is the second annual Supplement to the List of Journals published in January, 1950 (contained in Vol. 53), and gives additions and alterations made since December, 1950.

The addresses are believed to be correct, but no responsibility can be accepted for errors. Journals marked * are not received regularly.

AEG Mitt.	_AEG Mitteilungen._ Hohenzollerndamm 150, Berlin-Grunewald.
*_Acta Chem. Fenn._	_Acta Chemica Fennica._ [See under _Suomen Kemistilehti._]
*_Acta Chem. Scand._	_Acta Chemica Scandinavica._ Einar Munksgaard, Copenhagen.
Acta Phys. Hungarica	_Acta Physica Hungarica._ Formerly _Hungarica Acta Physica_ [_Hungar. Acta Phys._]. Address unchanged.
Acta Tech. Hungarica	_Acta Technica Hungarica._ Magyar Tudomanyos Akademia Konyvtara, Akademia-utca 2, Budapest 5.
Acustica	_Acustica._ S. Hirzel Verlag, Claridenhof, Gotthardstrasse 6, Zürich 2.
Akust. Beih.	_Akustische Beihefte._ [Issued under the auspices of the international acoustics journal _Acustica_ as a Supplement.] S. Hirzel Verlag, Claridenhof, Gotthardstrasse 6, Zürich 2.
Amer. Inst. Elect. Engrs Stand.	_American Institute of Electrical Engineers Standards._ 33 West 39th Street, New York 18.
*_Amer. Math. Monthly_	_American Mathematical Monthly._ [Abstracted by _Mathematical Reviews._]
*_Anglo-American Council on Productivity_	_Anglo-American Council on Productivity._ 21 Tothill Street, London, S.W.1; 2 Park Avenue, New York.
Ann. Acfas	_Annales de l'Acfas._ Association Canadienne-Française pour l'Avancement des Sciences, l'Université de Montréal, 2900 Boulevard du Mont Royal, Montreal 26.
*_Ann. Crimean Astrophys. Obs._	_Annals of the Crimean Astrophysical Observatory._ [Abstracted by _Astronomical News Letter._]
*_Ann. Mat. Pura Appl._	_Annali di Matematica Pura ed Applicata._ [Abstracted by _Mathematical Reviews._]
*_Ann. Math._	_Annals of Mathematics._ [Abstracted by _Mathematical Reviews._]
*_Arch. Met. Geophys. Bioklimatol. Ser. A_	_Archiv für Meteorologie, Geophysik und Bioklimatologie, Serie A._ [Abstracted by _Meteorological Abstracts._]
*_Archit. Rev._	_Architectural Review._ Architectural Press, 9–13 Queen Anne's Gate London, S.W.7.
Astrophys. Norveg.	_Astrophysica Norvegica._ Faculty of Mathematics and Science, University of Oslo, Blindern, per Oslo.
Atomics, Lond.	_Atomics._ Leonard Hill Technical Group, 17 Stratford Place, W.1. [Formerly referenced as _Atomics._]
Aust. J. Appl. Sci.	_Australian Journal of Applied Science._ Commonwealth Scientific and Industrial Research Organization, 314 Albert Street, East Melbourne, C.2.
Avh. Norske VidensAkad. Oslo, I. Mat.-Nat. Kl.	_Avhandlingar utgitt av Det Norske Videnskaps-Akademi i Oslo._ I. _Matematisk-Naturvidenskaplige Klasse._ Faculty of Mathematics and Science, University of Oslo, Blindern, per Oslo.
*_Beih. angew. Chem. u. Chem.-Ingen.-Tech._	_Beihefte zur "Angewandte Chemie und Chemie-Ingenieur-Technik."_ Verlag Chemie, Weinheim/Bergstrasse.
Ber. Verh. Sächs. Akad. Wiss. Lpz, Math.-nat. Kl.	_Berichte über die Verhandlungen der Sächsischen Akademie der Wissenschaften zu Leipzig._ Akademie-Verlag, Schiffbauerdamm 19, Berlin, N.W.7.
Beretn. Michelsens Inst. Vidensk.	_Beretninger Chr. Michelsens Institutt for Videnskap og Åndsfrihet._ Allégaten 70, Bergen.
Bol. Radiactividad	_Boletin de Radiactividad._ Instituto Nacional de Geofisica, Rios Rosas 9, Madrid.
Brit. Elect. Auth. Utilis. Res. Rep.	_British Electricity Authority. Utilisation Research Report._ British Electricity House, Great Portland Street, London, W.1.
*_Brit. Res. Rep._	_British Research Reports._ Technical Information and Documents Unit, Department of Scientific and Industrial Research, Lacon House, Theobalds Road, London, W.C.1.
*_Bull. Inst. Theor. Astron._	_Bulletin of the Institute for Theoretical Astronomy._ [Abstracted by _Astronomical News Letter._]
Bull. Soc. Chim. France	_Bulletin de la Société Chimique de France._ 45 rue d'Ulm, Paris, V^{e}.
Bull. Soc. Franc. Minér. Crist.	_Bulletin de la Société Française de Minéralogie et de Cristallographie._ Librairie Masson et Cie, 120 Boulevard Saint-Germain, Paris.
Bull. Tokyo Inst. Techn. Ser. A and B	_Bulletin of the Tokyo Institute of Technology, Series A and B._ Oh-Okayama, Meguroku, Tokyo.
Bull. Un. Exploit. Elect. Belge	_Bulletin de l' Union des Exploitations Electriques en Belgique._ 63 Rue Ducale, Brussels.
*_C.R. Rech. I.R.S.I.A._	_Comptes Rendus de l'Institut pour l'Encouragement de la Recherche Scientifique dans l'Industrie et l'Agriculture._ 52 Rue de la Concorde, Brussels.
Canad. J. Chem.	_Canadian Journal of Chemistry._ Formerly _Canadian Journal of Research, Section B_ [_Canad. J. Res. B_]. Address unchanged.
Canad. J. Math.	_Canadian Journal of Mathematics._ [_Journal Canadien de Mathématiques._] University of Toronto, Toronto.
Canad. J. Phys.	_Canadian Journal of Physics._ Formerly _Canadian Journal of Research, Section A_ [_Canad. J. Res. A_]. Address unchanged.
Canad. J. Techn.	_Canadian Journal of Technology._ Formerly _Canadian Journal of Research, Section F_ [_Canad. J. Res. F_]. Address unchanged.
Centen. Proc. Roy. Met. Soc.	_Centenary Proceedings of the Royal Meteorological Society._ 49 Cromwell Road, London, S.W.7.
Cienc. e Invest.	_Ciencia e Investigación._ Avda R. Sáenz Peña 555, Buenos Aires.
Commun. Dublin Inst. Adv. Stud.	_Communications of the Dublin Institute for Advanced Studies._ 64–65 Merrion Squaré, Dublin.

SUPPLEMENT TO LIST OF JOURNALS

Commun. Fac. Sci. Univ. d'Ankara	*Communications de la Faculté des Sciences de l'Université d'Ankara.* [Foreign language edition of *Ankara Universitesi Fen Fakultesi Mecmuasi.*] Ankara.
Dtsch. Akad. Wiss. Berlin, Veröff. Geodät. Inst. Potsdam	*Deutsche Akademie der Wissenschaften zu Berlin. Veröffentlichungen des Geodätischen Institutes in Potsdam.* Potsdam.
*_Dtsch. Wetterdienst U.S. Zone, Ber._	*Deutscher Wetterdienst in der U.S. Zone, Berichte.* [Abstracted by *Meteorological Abstracts.*]
*_Elect. Developm._	*Electrical Developments.* Electrical Machinery Development Centre, 5 Svitavska, Brno 2.
Elektron	See *Elektron, Garmisch.*
Elektron, Garmisch.	*Das Elektron in Wissenschaft und Technik.* Elektron-Verlag, Garmisch-Partenkirchen.
*_Elettrificazione_	*Elettrificazione.* Via Pacc N.19, Milan.
Elliott J.	*Elliott Journal.* Elliott Bros. (London), Century Works, Lewisham, London, S.E.13.
*_Energetika_	*Energetika.* Panska 2, Prague II.
Engng Rep. Nat. Tsing Hua Univ.	*Engineering Reports of National Tsing Hua University.* Peiping, China.
F & G Rdsch.	*F & G Rundschau.* Felten & Guilleaume Carlswerk, Cologne-Mülheim.
*_Foto-Kino-Tech._	*Foto-Kino-Technik.* [Abstracted by *Photographic Abstracts.*]
*_Gas Oil Pwr_	*Gas and Oil Power.* [Abstracted by Metropolitan-Vickers Electrical Co.]
*_Geophysica, Helsinki_	*Geophysica, Helsinki.* [Abstracted by *Meteorological Abstracts.*]
Glasn. Mat.-fiz. Astron.	*Glasnik Matematičko-fizički i Astronomski* [*Periodicum Mathematico-physicum et Astronomicum*]. Hrvatski Prirodoslovno Društvo [Societas Scientiarum Naturalium Croatica]. Marulicev trg 19, Zagreb.
*_Glass Ind._	*Glass Industry.* [Abstracted by *Photographic Abstracts.*]
Harvard Coll. Obs. Tech. Rep.	*Harvard College Observatory Technical Report.* Formerly *Harvard College Observatory and Center of Analysis of Massachusetts Institute of Technology Technical Report* [*Harvard Coll. Obs. Center Anal. Mass. Inst. Techn. Tech. Rep.*]. Address unchanged.
*_Hemel en Dampk._	*Hemel en Dampkring.* [Abstracted by *Meteorological Abstracts.*]
Indian East. Engr	*Indian and Eastern Engineer.* P.O. Box 2348, Calcutta; 39 Lombard Street, London, E.C.3.
Ingegnere	*L'Ingegnere.* Via delle Terme 90, Rome.
*_Ingén. et Tech._	*Ingénieurs et Techniciens.* [Abstracted by Metropolitan-Vickers Electrical Co.]
Instn Elect. Engrs, Monogr.	*Institution of Electrical Engineers, Monographs.* Savoy Place, W.C.2. [Available separately; to be published also in collected form as *Proceedings, Part IV.*]
*_Int. Ass. Terr. Magn. Elect. Bull._	*International Association of Terrestrial Magnetism and Electricity. Bulletin.* 6641 32nd Street, N.W., Washington 15, D.C.
*_Izv. Akad. Nauk, SSSR, Ser. Geogr. Geofiz_	*Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya i Geofizicheskaya.* [Abstracted by *Meteorological Abstracts.*]
Izv. Blg. Akad. Nauk	*Izvestiya Blgarskata Akademia na Naukitě. Otdelenie za Fizikomatematicheski i Tekhnicheski Nauki.* Rue 7 Noemvri, Sofia 1.
*_Izv. Crimean Astrophys. Obs._	*Izvestiya Crimean Astrophysical Observatory.* [Abstracted by *Astronomical News Letter.*]
J. Canad. Math.	*Journal Canadien de Mathématiques.* [See under *Canadian Journal of Mathematics.*]
J. Japan Soc. Appl. Mech.	*Journal of the Japan Society for Applied Mechanics.* Poste Restante, Box No. 24, Shibaya Post Office, Tokyo. [Formerly *Journal of the Society of Applied Mechanics of Japan* (*J. Soc. Appl. Mech. Japan*)].
*_J. Met. Soc. Japan_	*Journal of the Meteorological Society of Japan.* [Abstracted by *Meteorological Asbtracts.*]
*_J. Metals_	*Journal of Metals.* [Abstracted by Metropolitan-Vickers Electrical Co.]
J. Sci. Res. Benares Hindu Univ.	*Journal of Scientific Research of the Benares Hindu University.* Benares Hindu University, Banaras.
Japan. J. Astron.	*Japanese Journal of Astronomy.* Science Council of Japan, Ueno Park, Tokyo. [Formerly *Japanese Journal of Astronomy and Geophysics* (*Jap. J. Astron. Geophys.*)]
Japan Sci. Rev.	*Japan Science Review.* Engineering Society of Japan, Japan Industrial Club, Marunouchi, Chiyoda-ku, Tokyo.
*_John Crerar Libr. Bibl._	*John Crerar Library Bibliography.* John Crerar Library, 86 East Randolph Street, Chicago 1, Illinois.
Latv. PSR Zin. Akad. Vēst.	*Latvijas PSR Zinātnu Akademijas Vēstis.* Ul. Kommunalnaya 4, Riga.
Luz y Fuerza	*Luz y Fuerza.* Editorial Gabel, General Goded 1, Madrid.
*_Math. Gaz._	*Mathematical Gazette.* Royal Naval College, Greenwich, S.E.10.
Matrix Tensor Quart.	*Matrix and Tensor Quarterly.* Tensor Club of Great Britain. C/o S. A. Stigant, Esq., M.I.E.E., 7 Courtlands Avenue, Hayes, Kent.
*_Medd. Met. Inst., Uppsala_	*Meddelanden från Meteorologiska Institut.* Uppsala.
Mem. Fac. Engng Kyoto Univ.	*Memoirs of the Faculty of Engineering, Kyoto University.* Kyoto, Japan.
Mem. Fac. Sci. Engng, Waseda	*Memoirs of the Faculty of Science and Engineering.* Waseda University, Tokyo.
*_Met. Monogr. Amer. Met. Soc._	*Meteorological Monograph of the American Meteorological Society.* [Abstracted by *Meteorological Abstracts.*]
*_Min. Agric. Fish., Lond., Bull._	*Ministry of Agriculture and Fisheries, Bulletin.* H.M. Stationery Office, Kingsway, London, W.C.2.

SUPPLEMENT TO LIST OF JOURNALS

Mitt. Inst. Geophys. E.T.H. Zürich	*Mitteilungen aus dem Institut für Geophysik.* Eidgenössische Technische Hochschule Zürich. Leonhardstrasse, Zürich.
*Monogr. Ser. Res. Inst. Appl. Elect.	*Monograph Series of the Research Institute of Applied Electricity.* Hokkaido University, Sapporo, Japan.
Mullard Tech. Rep.	*Mullard Technical Report.* Mullard Electronic Products, Century House, Shaftesbury Avenue, London, W.C.2.
Nachrichtentechnik	*Nachrichtentechnik* [*Wissenschaftliche Beilage der Zeitschrift "Elektrotechnik" für das Gebiet der Fernmelde-und Radiotechnik*]. Verlag Technik, Unter den Linden 12, Berlin, N.W.7. [Issued as inset in "*Elektrotechnik*" until issue of October, 1951.]
Nat. Phys. Lab., Not. Appl. Sci.	*National Physical Laboratory, Notes on Applied Science.* H.M. Stationery Office, Kingsway, W.C.2.
*Nat. Verd., Copenhagen	*Naturens Verden.* Gyldendalske Boghandel, Nordisk Forlag, Copenhagen.
*Off. Tech. Serv. Wash., Rep.	*Office of Technical Services, Reports.* Department of Commerce, Washington 25, D.C. [Available as photostat, microfilm, or mimeographed.]
*Overseas Res. Rep.	*Overseas Research Reports.* Technical Information and Documents Unit, Department of Scientific and Industrial Research, Lacon House, Theobalds Road, London, W.C.1. [Available as microfilm.]
Pakistan J. Sci.	*Pakistan Journal of Science.* Pakistan Association for the Advancement of Science, University Institute of Chemistry, The Mall, Lahore.
Pakistan J. Sci. Res.	*Pakistan Journal of Scientific Research.* [Published with *Pakistan Journal of Science.*] Pakistan Association for the Advancement of Science, University Institute of Chemistry, The Mall, Lahore.
*Pop. Astron.	*Popular Astronomy.* Carleton College, Northfields, Minnesota.
Proc. Japan Acad.	*Proceedings of the Japan Academy.* C/o Science Council of Japan, Ueno Park, Tokyo.
Proc. Nat. Acad. Sci. India, Sect. A	*Proceedings of the National Academy of Sciences, India, Section A.* University Science Buildings, Allahabad.
*Proc. 7th Int. Congr. Appl. Mech.	*Proceedings of the 7th International Congress on Applied Mechanics.* [Abstracted by *Applied Mechanics Reviews.*]
*Proc. Soc. Exp. Stress Anal.	*Proceedings of the Society for Experimental Stress Analysis.* [Abstracted by Metropolitan-Vickers Electrical Co.]
*Process Engrav. Mon.	*Process Engravers Monthly.* [Abstracted by *Photographic Abstracts.*]
Prom. Energ.	*Promyshlennaya Energetika.* Vetoshnyĭ per., Gum III–ĭ, Korpus, Moscow.
*Publ. Obs. Haute-Provence	*Publications de l'Observatoire de Haute-Provence.* Saint-Michel Observatoire (Basses-Alpes).
Publ. Roy. Obs., Edinburgh	*Publications of the Royal Observatory.* Edinburgh.
QST	*QST.* American Radio Relay League, 38 LaSalle Road, West Hartford, Connecticut.
*Quart. J. Exp. Psych.	*Quarterly Journal of Experimental Psychology.* W. Heffer, 4 Petty Cury, Cambridge.
*Quart. J. Math. Oxford Ser.	*Quarterly Journal of Mathematics, Oxford Second Series.* [Abstracted by *Mathematical Reviews.*]
*R.C. Ass. Elettrotec. Ital.	*Rendiconti della Riunione Annuale dell'Associazione Elettrotecnica Italiana.* Via S. Paolo 10, Milan.
Rep. Mech. Lab., Tokyo	*Report of the Mechanical Laboratory.* Government Mechanical Laboratory, Agency of Industrial Science and Technology, Sumiyoshicho, Sunginami-ku, Tokyo.
Rev. Fis., Rio de Janeiro	*Revista de Fisica.* Escola Nacional de Engenharia, Largo de São Francisco, Rio de Janeiro.
*Rev. Gén. Chem. de Fer	*Revue Générale des Chemins de Fer.* [Abstracted by *Railway Engineering Abstracts.*]
Rev. Jeumont	*Revue Jeumont.* Forges et Ateliers de Constructions Electriques de Jeumont, Jeumont (Nord), France.
Rev. Telecomun.	*Revista de Telecomunicación.* Apartado 936, Palacio de Comunicaciones, Madrid.
*Riv. Met. Aeronaut.	*Rivista di Meteorologia Aeronautica.* [Abstracted by *Meteorological Abstracts.*]
*Rly Mech. Elect. Engr	*Railway Mechanical and Electrical Engineer* (formerly *Railway Mechanical Engineer*). [Abstracted by *Railway Engineering Abstracts.*]
*Rubber	*Rubber.* [Abstracted by the Research Association of British Rubber Manufacturers.]
Sci. and Cult.	*Science and Culture.* Indian Science News Association, 92 Upper Circular Road, Calcutta.
*Sci. Ind. Photogr.	*Sciences et Industries Photographiques.* [Abstracted by *Photographic Abstracts.*]
Sci. Pap. Osaka Univ.	*Scientific Papers from the Osaka University.* Osaka, Japan.
*Sci. Rep. Tôhoku Univ., 5th Ser. Geophys.	*Science Reports of Tôhoku University, Fifth Series—Geophysics.* [Abstracted by *Meteorological Abstracts.*]
Scientia, Asso	*Scientia.* 4 Via Roncaglia, Asso, Como. [Formerly referenced as *Scientia.*]
Siemens Austria Tech. Ber.	*Siemens Austria Technische Berichte.* Formerly *Siemens Austria Zeitschrift* [*Siemens Austria Z.*]. Address unchanged.
Siemens Z.	*Siemens Zeitschrift.* Siemens-Schuckertwerke Aktiengesellschaft, Hauptwerbeabteilung, Sieboldstrasse 5, Erlangen, Germany.
Skr. Norske VidenskAkad. Oslo. I.	*Skrifter utgitt av Det Norske Videnskaps-Akademi i Oslo.* I. *Matematisk-Naturvidenskaplige Klasse.* Faculty of Mathematics and Science, University of Oslo, Blindern, per Oslo.

SUPPLEMENT TO LIST OF JOURNALS

**Suom. Kem.*	*Suomen Kemistilehti.* [*Acta Chemica Fennica.*] Societas Scientiarum Fennica, Helsinki.
Tech. Hausmitt. NordwDtsch. Rdfunks	*Technische Hausmitteilungen des Nordwestdeutschen Rundfunks.* Funkhaus Hamburg, Rothenbaumchaussee 132–134, Hamburg 13.
Techn. Rep. Osaka Univ.	*Technology Reports of the Osaka University.* Faculty of Engineering, Osaka University, Osaka, Japan.
Techn. Rep. Tôhoku Univ.	*Technology Reports of the Tôhoku University.* Tôhoku University, Sendai, Japan.
Tekn. Skr, Oslo	*Tekniske Skrifter.* Norske Ingeniørforening, Kronprinsengate 17, Oslo.
Telefunken Ztg	*Telefunken Zeitung.* Technischwissenschaftliche Mitteilungen der Telefunken Gesellschaft für drahtlose Telegraphie, Mehringdamm 32–34, Berlin, S.W.61.
Telegr. en Telef.	*Telegraaf en Telefoon.* Vereniging van Hoger Personeel der PTT, J. W. Prisolaan 36b, Breda, Holland.
Texas J. Sci.	*Texas Journal of Science.* Texas Academy of Science, San Marcos, Texas.
Trans Instrum. Meas. Conf., Stockholm (1949)	*Transactions of the Instruments and Measurements Conference, Stockholm* (1949). Royal Swedish Academy of Engineering Sciences, Box 5073, Stockholm 5.
Trans Roy. Soc. S. Afr.	*Transactions of the Royal Society of South Africa.* University of Cape Town, Rondebosch.
**Trudy Sem. Vektor. Tenzor. Analizu*	*Trudy Seminara po Ventornomu i Tenzornomu Analizu s Ih Priloženiyami k Geometrii, Mehaniki i Fiziki.* [Abstracted by *Mathematical Reviews.*]
U.R.S.I. Proc. IXth Gen. Assembl.	*U.R.S.I. Proceedings of the General Assembly.* U.R.S.I. [International Scientific Radio Union], 42 Rue des Minimes, Brussels.
U.R.S.I. Spec. Rep.	*U.R.S.I. Special Report.* U.R.S.I. [International Scientific Radio Union], 42 Rue des Minimes, Brussels.
**U.S. Air Force Cambridge Res. Lab., Geophys. Res. Pap.*	*U.S. Air Force Cambridge Research Laboratories, Geophysical Research Papers.* [Abstracted by *Meteorological Abstracts.*]
VDE-Fachberichte	*VDE-Fachberichte.* VDE-Verlag, Friedrich-Ebert-Strasse 111, Wuppertal-Elberfeld.
Vacuum	*Vacuum.* W. Edwards and Co. (London), Worsley Bridge Road, Lower Sydenham, London, S.E.26.
Verh. K. Vlaamse Acad. Wetensch. Belg.	*Verhandelingen van de Koninklijke Vlaamse Academie voor Wetenschappen Letteren en Schone Kunsten van België.* Paleis der Academiën, Brussels.
**Wetter u. Leben*	*Wetter und Leben.* [Abstracted by *Meteorological Abstracts.*]
**Wiss. Abh. Reichsamt Wetterdienst*	*Wissenschaftliche Abhandlungen der Reichsamt für Wetterdienst.* [Abstracted by *Meteorological Abstracts.*]
**Z. Elektrochem. angew. phys. Chem.*	*Zeitschrift für Elektrochemie und angewandte physikalische Chemie.* Verlag Chemie, Weinheim/Bergstrasse, Germany.
**Z. phys. Chem.*	*Zeitschrift für physikalische Chemie.* Akademische Verlagsgesellschaft. Geest & Portig K.-G., Leipzig.
Z. wiss. Mikr.	*Zeitschrift für wissenschaftliche Mikroskopie und für mikroskopische Technik.* S. Hirzel Verlag, Birkenwaldstrasse 285, Stuttgart N.

Changes of Address

Arch. Math. Naturv.	*Archiv for Mathematik og Naturvidenskab.* Faculty of Mathematics and Science, University of Oslo, Blindern, per Oslo.
Bell Lab. Rec.	*Bell Laboratories Record.* Bell Telephone Laboratories, 463 West Street, New York 14, N.Y.
Curr. Sci.	*Current Science.* The Current Science Association, Malleswaran P.O., Bangalore 3.
Fuel	*Fuel.* Butterworths Scientific Publications, 19–23 Ludgate Hill, London, E.C.4.
J. Atmos. Terr. Phys.	*Journal of Atmospheric and Terrestrial Physics.* Butterworths Scientific Publications, Pergamon Press Ltd., 2, 3 and 5 Studio Place, London, S.W.1.
J. Sci. Industr. Res.	*Journal of Scientific and Industrial Research.* 20 Pusa Road, Delhi–5.
J. Text. Inst., Manchr	*Journal of the Textile Institute.* 10 Blackfriars Street, Manchester 3.
K. Danske Vidensk. Selsk., Mat.-fys. Medd.	*Det Kgl. Danske Videnskabernes Selskab, Matematisk-fysiske Meddelelser.* Ny Vestergade 23, Copenhagen 5.
Non-Destr. Test.	*Non-Destructive Testing.* American Industrial Radium and X-ray Society, 1109 Hinman Avenue, Evanston, Illinois.
Observatory	*Observatory.* The Royal Observatory, Herstmonceux Castle, Hailsham, Sussex.
Publ. Sci. Ass. Oceanogr. Phys.	*Publication Scientifique d'Association d'Océanographie Physique.* [Union Géodésique et Géophysique Internationale.] Prof. H. Mosby, Geophysiske Institutt, Bergen.
Research, Lond.	*Research.* Butterworths Scientific Publications, 19–23 Ludgate Hill, London, E.C.4.
Spectrochim. Acta	*Spectrochimica Acta.* The Pergamon Press, 2, 3 and 5 Studio Place, London, S.W.1.
Stockholms Obs. Ann.	*Stockholms Observatoriums Annaler.* Kungl. Vetenskapsakademiens Bibliotek, Stockholm 50.
Tekn. Tidskr.	*Teknisk Tidskrift.* Svenska Teknologföreningen, Box 16368, Stockholm 16.
Tôhoku Math. J.	*Tôhoku Mathematical Journal.* Mathematical Institute, Tôhoku University, Sendai.

Changes of Title

Canad. J. Res. A, B, F.	*Canadian Journal of Research, Sections A, B,* and *F.* Titles changed to *Canadian Journal of Physics* [*Canad. J. Phys.*]; *Canadian Journal of Chemistry* [*Canad. J. Chem.*]; and *Canadian Journal of Technology* [*Canad. J. Techn.*] respectively from Vol. 29, Jan., 1951. Address unchanged.
Harvard Coll. Obs. Center Anal. Mass. Inst. Techn. Tech. Rep.	*Harvard College Observatory and Center of Analysis of Massachusetts Institute of Technology Technical Report.* Title changed to *Harvard College Observatory Technical Report* [*Harvard Coll. Obs. Tech. Rep.*] from No. 5, 1950. Address unchanged.
Hungar. Acta Phys.	*Hungarica Acta Physica.* Title changed to *Acta Physica Hungarica* [*Acta Phys. Hungar.*] from Vol. 1, No. 1, 1951. Address unchanged.
J. Soc. Appl. Mech. Japan	*Journal of the Society of Applied Mechanics of Japan.* Title changed to *Journal of the Japan Society for Applied Mechanics* [*J. Japan Soc. Appl. Mech.*] from Vol. 3, No. 13, 1950. Address unchanged.
Japan. J. Astron. Geophys.	*Japanese Journal of Astronomy and Geophysics.* Title changed to *Japanese Journal of Astronomy; Japanese Journal of Geophysics* [*Japan. J. Astron.; Japan J. Geophys.*].
Siemens Austria Z.	*Siemens Austria Zeitschrift.* Title changed to *Siemens Austria Technische Berichte* [*Siemens Austria Tech. Ber.*] from Vol. 3, Sept., 1951. Address unchanged.

Abstracting Journals Supplement

Abstracts have been reprinted from other Journals with the kind permission of the following organizations, to whom grateful acknowledgment is made. (See also p. 14 and p. xii, 1950.)

BRITISH ABSTRACTS	Colquhoun House, Broadwick St., London, W.1. [Change of address.]
BRITISH SOCIETY OF RHEOLOGY	[Formerly BRITISH RHEOLOGISTS' CLUB.] Lyndhurst, Links Way, Little Bookham, Leatherhead, Surrey.
ELEKTROTECHNIK, BERLIN	Verlag Technik, Unter den Linden 12, Berlin, N.W.7.

NOTE ON THE UNIVERSAL DECIMAL CLASSIFICATION SYSTEM

The abstracts are classified by subject according to the Universal Decimal Classification, and arranged in order of their U.D.C. numbers, which are printed at the head of the Abstract on the right.

The complete tables of the 4th International Edition of the U.D.C. are in process of publication. The following Parts are now available from the British Standards Institution, 24 Victoria Street, London, S.W.1.

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Vol. 2, Part 2: Class 54 Chemistry. Price 10/- net.
Vol. 2, Part 3: Classes 55 Geology. Geophysics; 56 Palaeontology; 57 Biology; 58 Botany; 59 Zoology. Price 15/- net.

Abridged tables of certain sections were published with the January (1949) issues of *Science Abstracts*, by permission of the British Standards Institution, and a few reprints of these tables are available from The Institution of Electrical Engineers, Savoy Place, London, W.C.2.

The U.D.C. numbers of the main sections of *Science Abstracts* are given in the Contents List each month.

AUTHOR INDEX

For the sake of simplicity and uniformity, all names beginning with articles or prepositions are listed as if written as single words, regardless of nationality (e.g. Van Vleck is listed as if written Vanvleck). Cross-references are included in appropriate places. Compound names are listed under the last component, unless hyphenated. Exceptions to this rule have been appropriately cross-referenced.

An asterisk * following an Abstract Number indicates that an erratum will be found on p. vii.

Aamodt, L. *See under* Aamodt, R. L.

Aamodt, R. L. *See also* Panofsky, W. K. H., 1300, 4691

Aamodt, R. L., Hadley, J. and Panofsky, W. K. H. The gamma-ray spectrum from the absorption of π^--mesons in deuterium, 2023

Aamodt, R. L., Panofsky, W. K. H. and Phillips, R. π^- absorption in D_2 and the *n-n* force, 9724

Aarts, W. H. *See* Molenaar, J., 328

Abadie, P., Epelboin, I. and Pistoulet, B. On the interest of the study of magnetic powders by the use of electromagnetic waves, 1040

Abadie, P., Vassy, A. and Vassy, E. Light of the night sky; effect of latitude, 4950

Abascal, E. Vidal. *See* Vidal Abascal, E.

Abbad, M. *See* Rivoir, L., 3919

Abbott, J. R. and Miller, S. A. Observation of cool flames with ethylene, 9763

Abdullaev, A., Zhdanov, G., Kamenetskiĭ, Yu., Naumov, A. and Khaĭdorov, A. Concerning the origin of secondary slow mesons in the atmosphere, 5547

Abe, H. *See* Kumagai, H., 7097, 9600

Abelès, F. On the simultaneous determination of the optical constants and the thickness of very thin metallic films, 988. Investigations on the propagation of sinusoidal electromagnetic waves in stratified media. Application to thin films, 1199; II. Thin films, 2575. Two theorems relating to the propagation of waves in stratified media, 6141

Aberth, E. *See* Maslan, F., 6188

Abragam, A. Paramagnetic resonance and hyperfine structure in the iron transition group, 7089. *See also* Perrin, F., 5334

Abragam, A. and Pryce, M. H. L. Theory of the nuclear hyperfine structure of paramagnetic resonance spectra in crystals, 2821. The theory of the nuclear hyperfine structure of paramagnetic resonance spectra in the copper Tutton salts, 5576. The theory of paramagnetic resonance in hydrated cobalt salts, 5577

Abraham, B. M. *See also* Osborne, D. W., 5359

Abraham, B. M., Osborne, D. W. and Weinstock, B. Vapor pressure, critical point, heat of vaporization and entropy of liquid He^3, 1805

Abrahams, S. C., Collin, R. L. and Lipscomb, W. N. The crystal structure of hydrogen peroxide, 2176

Abramov, A. Ya. Energy levels of Mn^{56} and V^{52}, 3007

Abramowitz, M. Coulomb wave functions expressed in terms of Bessel–Clifford and Bessel functions, 5131

Abramson, I. S. and Gegechkori, N. M. Oscillographic investigation of the spark discharge, 6986

Abrikosov, A. A. and Khalatnikov, I. M. Radiation corrections to Dirac's equation (in nonrelativistic approximation), 8509

Abson, W. *See* Taylor, D., 5684

Accardo, C. A. *See* Lehovec, K., 8654

Acheson, L. K., Jr. Effect of finite nuclear size on the elastic scattering of electrons, 5659

Achter, M. R. and Smoluchowski, R. Anisotropy of diffusion in grain boundaries, 9012

Ackeret, J. Aerodynamic cooling effects, 2452

Ackerman, E. Resonances of biological cells at audible frequencies, 7632. Vibrating plate transducers for frequency studies of the breakdown rate of biological cells, 8599

Ackroyd, J. O. *See* Combridge, J. H., 6661

Adair, R. K. Neutron cross sections of the elements, 650. Neutron scattering resonances of lithium, 1325. On the low states of He^5 and Li^5, 6391. *See also* Bockelman, C. K., 9710; Peterson, R. E., 627

Adam, G. D. and Standley, K. J. Ferromagnetic resonance in manganese arsenide, 491

Adams, C. A. A discussion on detonation: two new streak cameras, 3128

Adams, D. P. An index of nomograms, 2295

Adams, E. N., II. On the tritium h.f.s. and the anomalous magnetic moment of the triton, 2926

Adams, E. T. *See* Ball, J. G., 2640

Adams, G. D. Characteristics of some films for 20 million volt X-rays, 6669

Adams, J. Low-angle X-ray scattering from ramie and jute, 3079

Adamson, J. Ocular scanning and depth perception, 9873

Adamson, R. E., Jr, Buechner, W. W., Preston, W. M., Goodman, C. and Van Patter, D. M. The neutron yield from the $C^{13}(p, n)N^{13}$ reaction, 2999

Adcock, W. A. *See* Hornig, D. F., 177

Addario, M. M. and Tamburino, S. Nuclear disintegrations at 29 000 meters above sea level, 2804. Nuclear disintegrations at high altitude, 3621

Addink, N. W. H. The degree of imperfection of crystals, 3904

Addison, C. C. and Elliott, T. A. The properties of freshly formed surfaces. XV. The application of the contracting liquid-jet technique to the measurement of tensions at liquid-liquid interfaces, 3163; XVI. Dynamic tensions of sodium dodecyl sulphate solutions at the surface of liquid → air and liquid → liquid contracting jets, 3164; XVII. The measurement of surface and interfacial tensions of solutions, employing stationary waves on a vertical jet, 3165

Adel, A. Rotational structure in the *R* branch of the atmospheric nitrous oxide band at $8 \cdot 6\ \mu$, 3994. The emission spectra of the earth's surface, the troposphere, and lower stratosphere, 4931

Adelsberger, U. *See* Scheibe, A., 6010

Aden, A. L. Microwave reflection from water spheres, 4546. Electromagnetic scattering from sphere with sizes comparable to the wavelength, 5604

Adirovich, E. I. On the anomalously great decay time for some dipolar emitted radiations, 3682. The ionization mechanism and the temperature dependence of photoconductivity and luminescence of crystals, 6136

Adler, F. P. and Margenau, H. Electron conductivity and mean free paths, 349

Adler, F. T. *See* Curtiss, C. F., 2891

Adler, N. The discoloration of natural blue and violet rocksalt crystals, 734.* *See also* Wieninger, L., 739, 4895, 9407

Adolfsson, T. On the possible existence of some non-homogeneities in the international photographic magnitude scale for brighter stars, 815

Adolph, R., Kneser, H. O. and Schulz, I. The characteristic frequencies of cylindrical steel rods, 4177

Aeppli, H., Bishop, A. S., Frauenfelder, H., Walter, M. and Zünti, W. Influence of the atomic shell on nuclear angular correlation in Cd^{111}, 6445

Aeschlimann, F. On the persistence of geometrical structures in the development of physical theories, 4071

Afaf, M. Band-spectrum of ZrO, 189

Affleck, J. H. *See* Hensley, E. B., 407, 4491

Agar, A. W. and Revell, R. S. M. Replica techniques in electron microscopy, 3082

Agarwala, B. K. and Auluck, F. C. Statistical mechanics and partitions into non-integral powers of integers, 2397

Agarwala, K. S. The mobility of the small ions of the atmosphere at Poona, 4953

Agashe, V. V. The role of a positive column in the reduction of current due to external light in an electrodeless discharge, 7924

Agekyan, T. A. The dynamics of stellar passage through a cloud of meteoric material, 58. Dynamics of the movement of stars through igneous cloud, 2339

AUTHOR INDEX

Ageno, M. Some considerations on the scintillation phenomena of organic crystals, 9393
Ageno, M., Chiozzotto, M. and Querzoli, R. Scintillations in liquids and solutions, 212
Ageno, M. and Querzoli, R. Theory of the mechanism of the scintillation of organic crystals, 9389
Aggarwal, R. R. Diffraction of light by ultrasonic waves, 234
Agnew, H. M. *See* Leland, W. T., 6460
Agnew, J. T., Franklin, R. G. and Benn, R. E. A ten channel infrared spectrograph, 4240
Agostinelli, C. Influence of the solar magnetism on the motion of rotation of the earth, 3302
Aguilar, M. *See* Senent, S., 6547, 8318
Aguirre, R. M. *See* Mathieu, J.-P., 4298
Ahmad, S. Shamin. *See* Shamin Ahmad, S.
Ahmed, M. S. The state of ionization in lithium hydride, 9833
Ahmed, R. *See* Rais-Ahmed; Yasin, M., 6278, 9541
Aidzu, K., Fujimoto, Y. and Fukuda, H. On the production of mesons by X-rays, 8198
Aidzu, K., Fujimoto, Y., Fukuda, H., Hayakawa, S., Takayanagi, K., Takeda, G. and Yamaguchi, Y. On the negative π-meson capture, 5120
Aigrain, P. Inverse current in high-voltage germanium diodes, 1836
Aigrain, P., Dugas, C. and Germain, J. Adsorption on semi-conductors, 5882
Aigrain, P. R., Dugas, C. R. and Etzel, H. W. Semiconducting materials. Electrical characteristics and anomalies of germanium. I. Rectifier and transistor effect in germanium; II. Anomalies of germanium, 7862
Aitchison, P. M. Differential phase change at reflexion, 226. An electro-deposited surface roughness standard, 1336
Aitchison, P. M. and Aitchison, R. E. Two improved methods of graticule production using evaporated metal films, 1348
Aitchison, R. E. Preparation of photoconductive cadmium sulphide, 6223. *See also* Aitchison, P. M., 1348
Ajzenberg, F. Energy levels of B^{10}, 4717. Low states of F^{17} and neutrons from $O^{16} + D$, 8970. *See also* Richards, H. T., 8790
Akabori, H. *See* Kubo, T., 3199
Akhiezer, A. and Pomeranchuk, I. Determination of the non-electromagnetic interaction between electrons and neutrons, 5471
Akhiezer, A. I. and Faĭnberg, Ya. B. The interaction of a beam of charged particles with electron plasma, 377
Akhiezer, A. I., Lyubarskiĭ, G. L. and Faĭnberg, Ya. B. On the Cherenkov effect and the complex Doppler effect, 376
Akin, S. W. The thermodynamic properties of helium, 277
Akioka, T. *See* Itoh, J., 2832
Akishin, P. A. and Tatevskiĭ, V. M. The intensity of the valence-vibration line of the C=C bond in combination scattering spectra of hydrocarbons, 6120
Akulov, N. S. and Kakushadze, T. I. Atomic magnetic moments of Fe, Co, Ni, 8907
Akulov, N. S. and Svirina, E. P. The kinetics of the change of energetic anisotropy on superstructure transitions, 6354
Alberman, K. B. A small high-temperature high-vacuum furnace, 258
Albouy, G. and Faraggi, H. On the eradication of unwanted electron tracks in electron-sensitive nuclear emulsions without loss of sensitivity, 9223
Albouy, G. and Teillac, J. On the internal-conversion radiation of plutonium 239, 3742
Albrecht, H. O. *See also* Mandeville, C. E., 1128–9, 1883–4
Albrecht, H. O. and Mandeville, C. E. Crystals for the scintillation Geiger counter, 3589
Alburger, D. *See* Friedlander, G., 1274
Alburger, D. E. Heat production in potassium, 5687. Gamma-ray transitions in B^{10}, 7265
Alburger, D. E. and Friedlander, G. Gamma-radiation from Pb^{206}, 4676. The beta-ray spectrum of Tl^{206}, 7226
Alburger, D. E. and Hafner, E. M. Nuclear energy levels, Z–11 to 20, 2912
Alcock, N. Z. *See also* Hurst, D. G., 1322 .3796
Alcock, N. Z. and Hurst, D. G. Neutron diffraction by the gases N_2, CF_4, and CH_4, 9007
Alden, E. D. *See* Koller, L. R., 7777
Alder, F. and Yu, F. C. On the magnetic moment of Mg^{25}, Re^{185}, Re^{187} and Be^9, 5666. On the spin and magnetic moment of O^{17}, 5669
Alder, N. L. *See* Jones, F. E., 2196, 9192
Aldington, J. N. Changes in colour sensitivity of the eye with posture, 8390
Aldrich, L. T. The evaporation products of barium oxide from various base metals and of strontium oxide from platinum, 9567
Alekseevskiĭ, N. E. Superconductivity of Bi_2K, 9484. *See also* Eselson, B. N., 9428
Aalmany, J. Català de. *See* Català de Alemany, J.
Aler, B. and Björklund, O. A coincidence scintillation spectrometer, 2767
Alers, P. B., McWhirter, J. W. and Squire, C. F. Eddy currents and supercurrents in rotating metal spheres at liquid helium temperatures, 9485
Alexander, A. E. and Posner, A. M. A method of integrating the Gibbs adsorption isotherm, 713
Alexander, B. H. *See also* Kuczynski, G. C., 3801
Alexander, B. H., Dawson, M. H. and Kling, H. P. The deformation of gold wire at high temperature, 4807
Alexander, F. W. Standard musical pitch, 6811
Alexander, K. F. On the determination of the Soret coefficients with the aid of permeable membranes, 9319
Alexander, L. G. and Coldren, C. L. Droplet transfer from suspending air to duct walls, 9076
Alexanderson, E. L. *See* Gemant, A., 4628
Alford, W. L. *See* Leighton, R. B., 8810
Alfsen, E. Lagrangian formulation of Flint's theory of electrons, 5378
Alfvén, H. Cosmical electrodynamics, 2309. The theory of magnetic storms and auroras, 8371
Alger, P. L. *See* Smith, J. J., 3251
Alger, R. S. Integrating crystal detectors for high energy photons and particles, 8796
Aliverti, G. and Solaini, L. On the velocity of propagation of seismic waves over short distances, 3950
Allais, J. An apparatus using a Renard series, 8426
Allan, D. L. and Poole, M. J. Experiments on the reaction $T(d, n)^4He$. I. The 90° cross-section, 2042; II. The angular distribution, 2043
Allard, G. A new type of perturbation, 3327
Allcock, G. McK. Variability of sky-wave radio signals under conditions of ionospheric absorption, 1952
Allen, A. J. *See also* Sun, K.-H., 5741, 5755
Allen, A. J., Nechaj, J. F., Sun, K.-H. and Jennings, B. Thick target fast neutron yield from 15-MeV deuteron and 30-MeV alpha-bombardment, 4698
Allen, C. W. *See also* Christiansen, W. N., 5026; Woolley, R. v. d. R., 3280
Allen, C. W. and Gum, C. S. Survey of galactic radio-noise at 200 Mc/s, 799
Allen, D. N. de G. and Dennis, S. C. R. The application of relaxation methods to the solution of differential equations in three dimensions, 9225
Allen, D. N. de G. and Severn, R. T. The application of relaxation methods to the solution of non-elliptic partial differential equations, 9413
Allen, D. N. de G. and Sopwith, D. G. The stresses and strains in a partly plastic thick tube under internal pressure and end-load, 3084
Allen, H. A. *See* McKinney, C. R., 562
Allen, H. C., Jr and Cross, P. C. The hydrogen sulfide band at 1 180 cm^{-1}, 4277
Allen, H. C., Jr, Cross, P. C. and King, G. W. The vibrational energy of H_2S, 1744
Allen, J. A. and Mitchell, J. W. The adsorption of gases on copper films, 1452
Allen, J. A., Van. *See* Van Allen, J. A.
Allen, J. E. Voltage gradients in high current spark channels, 2715. The distribution of electron energies in a discharge constricted by its self-magnetic field, 6983
Allen, J. S. *See also* Smith, P. B., 4644
Allen, J. S. and Engelder, T. C. Scintillation counting with an EMI 5311 photomultiplier tube, 7038

Allen, K. W. *See also* Dewan, J. T., 1131

Allen, K. W., Almqvist, E., Dewan, J. T., Pepper, T. P. and Sanders, J. H. The T + T reactions, 5759

Allen, K. W. and Dewan, J. T. The emission of long-range charged particles in the slow neutron fission of heavy nuclei, 1314. The emission of short-range charged particles in the slow neutron fission of uranium, 5789

Allen, N. L. Heavy current arcs in a transverse magnetic field, 5433

Allen, N. P., Schofield, T. H. and Tate, A. E. L. Mechanical properties of α solid solutions of copper, with zinc, gallium, germanium and arsenic, 9746

Allen, P. W., Mackle, H. and Sutton, L. E. An improved electron diffraction camera, 5463

Allen, P. W. and Sutton, L. E. The molecular structures of the acetyl halides, 9023

Allen, R. A. *See* Grace, M. A., 6439

Allen, R. C. and Rall, W. Proton groups from the deuteron bombardment of F^{19} and P^{31}, 3014

Allen, T. L. *See* Bigeleisen, J., 7343

Allen, W. A. and Parkin, P. H. Acoustics and sound exclusion, 7647

Allen, W. A. and Stark, R. H. Ray tracing using the IBM Card Programmed Electronic Calculator, 8614

Allen, W. D. Separation of stable isotopes by electromagnetic means, 9646

Allen, W. D., Dawton, R. H., Bär, M., Mendelssohn, K. and Osen, J. L. Superconductivity of tin isotopes, 1851

Allen, W. D., Dawton, R. H., Lock, J. M., Pippard, A. B. and Shoenberg, D. Superconductivity of tin isotopes, 1850

Aller, L. H. Turbulence in the interstellar medium, 3270. *See also* Pierce, A. K., 7464

Allis, W. P. *See* Lax, B., 1075

Allison, H. W. *See* Moore, G. E., 2608, 3117

Allmand, D. E. *See* McMillen, J. H., 872, 3353

Allred, J. C. *See also* Rosen, L., 8188

Allred, J. C., Froman, D. K., Hudson, A. M. and Rosen, L. The D–He^4 interaction for 10·3-MeV deuterons, 8190

Allred, J. C., Phillips, D. D. and Rosen, L. Angular distribution of protons from the $D(d, p)T$ reaction at 10·3-MeV bombarding energy, 8189; Erratum, 8972

Allred, J. C., Rosen, L., Tallmadge, F. K. and Williams, J. H. Nuclear multiple plate camera, 4988

Allshouse, C. C. *See* Florence, J. M., 1761

Allsopp, C. B. Radiation chemistry. I. Radiation chemistry in relation to radiobiology, 9775

Almond, M. *See* Hawkins, G. S., 802

Almqvist, E. Fast neutrons from T + D and T + Li reactions, 615. *See also* Allen, K. W., 5759

Almy, G. M. *See* Diven, B. C., 2047

Alpert, D. Vacuum valve for the handling of very pure gases, 7610

Alpert, D., Matland, C. G. and McCoubrey, A. O. A null-reading absolute manometer, 7583

Alpert, N. L. *See* Thomas, J. L., 2899

Alpher, R. A. Theoretical geomagnetic effects in cosmic radiation, 2799

Alpher, R. A. and Herman, R. C. Erratum: Theory of the origin and relative abundance distribution of the elements, 2312. Neutron-capture theory of element formation in an expanding universe, 9682

Alter, H. W. *See* Calvin, M., 7361–2

Altman, D. *See* Wise, H., 5847

Altman, H. *See* Rubin, T., 8699

Altman, J. H. An improved slit for a projection microphotometer, 4223. *See also* Perrin, F. H., 4979

Altmann, S. L. Relation between the Franck–Condon frequencies of absorption and fluorescence for some unsaturated hydrocarbons, 1217

Altshuler, S. A. Relation between paramagnetic absorption and permeability, 7086

Alvarez, L. W. Three new delayed alpha-emitters of low mass, 2003

Alymova, M. M. *See* Eĭdus, L. Kh., 3608

Amaldi, E., Castagnoli, C., Gigli, A. and Sciuti, S. The transition effect of star phenomena in cosmic rays, 463. Contribution to the study of extensive showers, II, 1910

Amaldi, E. and Fidecaro, G. An experiment on the anomalous scattering of fast μ-mesons by nucleons, 639, 4756

Amaldi, E., Fidecaro, G. and Mariani, F. On the Coulomb scattering of μ-mesons by light nuclei, 640. On the influence of the spin interaction on the scattering of mesons and electrons by light nuclei, 839

Amand, R. *See* Prigogine, I., 120, 3385

Amat, G. Influence of the width of the slit on the spectrometric determination of absorption bands, 6848. Measurement of the relative infra-red absorption of the fundamental and first harmonic bands of some C–H vibrations, 6860

Ambartsumyan, V. A. Stellar associations and the origin of stars, 1584. Distribution of hot giants in the outer parts of spiral galaxies, 2348

Ambarzumian, W. A. Stellar grouping and the origin of stars, 8467

Amble, E. and Dailey, B. P. The structure and dipole moment of hydrazoic acid, 1961

Ambrose, E. J. *See also* Elliott, A., 7725

Ambrose, E. J. and Elliott, A. The structure of synthetic polypeptides. II. Investigation with polarized infra-red spectroscopy, 3172. Infra-red spectra and structure of fibrous proteins, 5271. Infra-red spectroscopic studies of globular protein structure, 7730

Ambrose, E. J., Elliott, A. and Temple, R. B. The use of polarized infra-red radiation in the study of crystal structure, 5909

Ambrose, J. S. *See* Curry, B., 6088

Ambrosino, G. and Piatier, H. Remarks on the values of nuclear radii deduced from α-radioactivity, 3700

Amdur, I., Kells, M. C. and Davenport, D. E. Collision cross sections of hydrogen and of deuterium, 2758

Amdursky, M. E., Reed, W. O. and Pakswer, S. New image-converter-type tubes for use with standard electron multiplier photocells, 6222

Amelin, A. G. The formation of radiation clouds, 6620

Amelinckx, S. An interferometric study of cleavage surfaces of artificially grown crystals of sodium chloride, 5906. Spiral growth on carborundum crystal faces, 7374. Growth mechanism of carborundum crystals, 9813

Amemiya, A. *See* Saito, O., 132

Amerio, A. On the origin of cosmic rays, 1900. The expansion of the universe and the pressure of light, 2320

Ames, J., Cottrell, T. L. and Sampson, A. M. D. An electron microscope study of crystal surfaces, 3194

Amfiteatrova, T. A. *See* Rozhanskiĭ, V. N., 6511

Amiel, J. and Rodier, G. Thermal analysis of active manganese dioxide, 5898

Amine, D. *See* Darmois, E., 2127

Ammar, I. A. *See* Conway, B. E., 9067

Amoignon, J. *See* Debiesse, J., 7986

Amorós, J. L. The utilization of a new Jong–Bouman camera, 9823. *See also* Torraja, J. M., 3200

Amorós, J. L. and Font-Altaba, M. Expression for the vectorial complex for each of the 230 crystal groups, 9818

Ampariotis, P. A. *See* Petropoulos, G. M., 7917

Anantakrishnan, S. V. Arrhenius parameters and chemical reactivity, 692

Ananthakrishnan, R. Intensity variations in sunspots, 9240

Anderegg, J. W. *See* Leonard, B. R., Jr, 7426

Anderko, K. *See* Schubert, K., 4909, 9145

Andersen, C. E. Some transmutations of the elements in the atmosphere by cosmic rays, 2800. Effects of cosmic rays shown in pictures, 2801

Andersen, D. L. *See* DeFord, D. D., 696

Andersen, F. Studies on the mechanical properties of cellulose fibers in relation to the internal structure, 3800

Andersen, J. R. Some new values of the second enthalpy coefficient for dry air, 278

Anderson, A. B. and Munson, W. A. Electrical excitation of nerves in the skin at audiofrequencies, 5953

Anderson, C. H. *See* Fassel, V. A., 2152

Anderson, D. V. *See* Northwood, T. D., 149

Anderson, E. C., Arnold, J. R. and Libby, W. F. Measurement of low level radiocarbon, 4627

AUTHOR INDEX

Anderson, E. C. and Libby, W. F. World wide distribution of natural radio-carbon, 2935

Anderson, H. C. *See* Frevel, L. K., 3915

Anderson, H. L. Resonance capture of neutrons by uranium, 2053. *See also* Smaller, B., 4614

Anderson, J. L. and Bergmann, P. G. Constraints in covariant field theories, 8502

Anderson, J. S. *See* Bevan, D. J. M., 1056

Anderson, L. J. *See* Bellaire, F. R., 9199

Anderson, N. S. and Delsasso, L. P. The propagation of sound in carbon dioxide near the critical point, 6799

Anderson, P. W. Generalizations of the Weiss molecular field theory of antiferromagnetism, 481. Two comments on the limits of validity of the P. R. Weiss theory of ferromagnetism, 2823. Pressure broadening of the ammonia inversion line by foreign gases: quadrupole-indiced dipole interactions, 2904. Limits on the energy of the antiferromagnetic ground state, 9587

Anderson, R. A. *See* Smith, R. D., 9676

Anderson, R. B., Friedel, R. A. and Storch, H. H. Fischer–Tropsch reaction mechanism method involving stepwise growth of carbon chain, 4819

Anderson, R. S. *See also* Burkhalter, J. H., 202

Anderson, R. S., Johnson, C. M. and Gordy, W. Resonant absorption of oxygen at 2·5-millimeter wave-length, 9384

Anderson, R. S., Smith, W. V. and Gordy, W. Line breadth of the fine structure of the microwave spectrum of oxygen, 4248

Anderson, T. H. and Lingafelter, E. C. The structure of potassium fluoride dihydrate, 3928

Anderson, W. E. *See also* Simmons, J. W., 1735

Anderson, W. E., Sheridan, J. and Gordy, W. Microwave spectrum and molecular structure of GeF_3Cl, 4270

Anderson, W. E., Trambarulo, R., Sheridan, J. and Gordy, W. The microwave spectrum and molecular constants of trifluoromethyl acetylene, 4271

Anderson, W. T., Jr. Xenon compact arc lamps, 6162

Ando, R. *See* Sawada, S., 6949

Andrade, E. N. Da C. The physics of the deformation of metals, 1374

Andrade, E. N. Da C. and Dodd, C. The effect of an electric field on the viscosity of liquids. II, 1637

Andrade, E. N. Da C. and Kennedy, A. J. A surface effect in the creep behaviour of polycrystalline lead, 6516

Andrade, E. N. Da C., Randall, R. F. Y. and Makin, M. J. The Rehbinder effect, 2112

Andreae, J. H. *See* Lamb, J., 7631

Andreev, V. D., Letina, L. E. and Mendelev, B. G. Distribution of the electric field in a three-electrode gas discharge tube with a high back-voltage, 5444

Andrew, E. R. Nuclear magnetic resonance absorption in $NaSbF_6$, 5549. Nuclear resonance in solid hydrocarbons, 7164

Andrew, J. H. and Tendolkar, G. S. Application of dilatometry to powder metallurgy, 1337

Andrews, C. L. Erratum: Diffraction pattern in a circular aperture measured in the microwave region, 4547. A correction to the treatment of Fresnel diffraction, 5322. Diffraction pattern of microwaves near rods, 4549

Andrews, E. B. and Barrow, R. F. The band-spectrum of carbon monofluoride, CF, 6112

Andrews, H. L. and Shore, P. A. X-ray dose determination with chloral hydrate, 706

Andrews, R. K. *See* Laird, R. K., 972

Andrillat, H. Electronic temperature of gaseous nebulae: N.G.C. 7027, N.G.C. 6572, N.G.C. 7662, N.G.C. 7009 and Orion, 2350

Andrychuk, D. The Raman spectrum of fluorine, 8110

Angelakos, D. J. Current and charge distributions on antennas and open-wire lines, 7123

Anger, H. O. New type counting-rate recorder, 7972

Angyal, C. L., Barclay, G. A. and Le Fèvre, R. J. W. The dipole movements of ethylene oxide and carbonyl chloride in benzene solution, and a note on a useful modification of Barclay and Le Fèvre's equation, 2900

Annaev, R. G. Anomaly of the ven thermomagnetic effect of alloys of the system Ni–Mn, 8078

Annis, M. *See* Bridge, H. S., 6300

Ansbacher, F. and Ehrenberg, W. Electron-bombardment conductivity of dielectric films, 5412

Anselm, A. I. Some problems of the electron theory of crystals, 9625

Anslow, G. A. Polymer types and specific absorptions in the ultra-violet by hydrogen-bridged amides and alcohols with application to the protein structure problem, 7718

Ansoff, H. I. and Yachter, M. Stability of flow in a rocket motor, 6051

Antes, L. L. *See* Hackerman, N., 1033

Anthony, R. A simple conversion of the Beckman IR-2 into a monochromator, 5264

Anthony, R. L. *See* Witte, R. S., 6507

Antoneva, N. M., Bashilov, A. A. and Dzhelepov, B. S. β-spectrum of Ag^{110}, 6430

Antoneva, N. M., Bashilov, A. A., Dzhelepov, B. S. and Zolotavin, A. V. Emission of Au^{198}, Ho^{166} and Lu^{177}, 3728

Antonoff, G., Urmanczy, A. and Yakimac, A. Discontinuities in the properties of matter as a function of the temperature, 1648

Apker, L. *See also* Taft, E., 7900

Apker, L. and Taft, E. Photoelectric emission from *F*-centers in KI, 318. Exciton-enhanced photoelectric emission form *F*-centers in RbI near 85°K, 4391. Energy distribution of external photoelectrons from *F*-centers in RbI, 6973

Appleton, E. Studies of the F_2 layer in the ionosphere, I. The position of the ionospheric equator in the F_2 layer, 2202

Appleton, G. L. *See* Warshaw, S. D., 2011

Appleyard, R. K. The stopping power of liquid water, 5712

Ara, T. *See* Kubota, H., 4306, 7786

Arabadzhi, V. I. Electric wind from a point electrode, 2711

Arakatsu, B., Sonoda, M., Uemura Y., Yasumi, S. and Saji, Y. The photo-disintegration of Be by the high energy γ-rays, 6461

Arakawa, Y. *See* Motokawa, K., 6658, 7427

Araki, G. Production of scalar and pseudoscalar mesons by photons, 5794

Araki, G. and Mori, Y. Pseudoscalar meson theory and ground state of deuteron, 7546

Araki, G., Tutihasi, S. and Watari, W. Electronic states of C_2-molecule. I. Interaction between *p*-electrons, 8088

Araki, J. On the cross section for photomeson production, 7289

Archer, A. I. VENDAC-A Venn diagram analogue computer, 1565. A Venn diagram analogue computer, 1566

Archer, J. E. *See* Harrison, G. R., 7576

Archibald, W. J. *See* Guptill, E. W., 546

Arden, T. V. and McGlone, P. Absorption spectra of the sodium peruranates, 191

Ardillon, J.-M. *See* Lejay, P., 8066

Arenberg, D. L. Determination of elastic constants in single crystals with especial reference to silver chloride, 670

Arfken, G. B. *See also* Biedenharn, L. C., 8156, 8948

Arfken, G. B., Biedenharn, L. C. and Rose, M. E. A note on isotropy in nuclear gamma-radiation, 9677

Argence, E. On some approximate expressions for the refractive index of an ionized medium in the earth's magnetic field, 8379

Argo, H. V. *See* Jarvis, G. A., 608

Argyle, A. A. *See* Judson, C. M., 1453, 5883

Argyle, P. E., Griffiths, G. M. and Warren, J. B. A method of measuring gamma-ray absorption coefficients at 0·51 Mev, 3754

Argyle, P. E. and Warren, J. B. The angular correlation of annihilation radiation, 3743

Arifov, U. and Lovtsov, V. M. Application of a functional [time-base] sweep circuit for the oscillographic determination of heats of adsorption of ions and atoms of alkali metals, 3878

Arizumi, T. and Esaki, L. On the thoria coated cathode, 1147. Conductivity and electronic energy state of thoria coated cathode, 1148. On the secondary electron emission from the thoria coated cathode and the thin film deposited by evaporation from the cathode, 6264

Arizumi, T. and Imaeda, K. Absorption of nitrogen by evaporated film of barium, 1346

Arizumi, T. and Narita, S. On the activation of the oxide coated cathode, 5509. On the Schottky effect of the oxide coated cathode, 6294

Arizumi, T. and Tani, S. On the electrical conductivity of alumina, 2681

Arkhangelskaya, V. A. and Bonch-Bruevich, A. M. Variation of the conductivity of cadmium sulphide under irradiation with electrons, 6220

Arlman, E. J. and Melville, H. W. Studies in copolymerization. The evaluation of the kinetic coefficients for the system styrenebutyl acrylate, 724

Arlman, J. J. *See* Daams, H., 9020

Armellini, G. On the origin of the solar system, 3272

Armenteros, R., Barker, K. H., Butler, C. C., Cachon, A. and Chapman, A. H. Decay of V-particles, 6297

Armitage, M. D. *See* Lees, C. S., 1091

Armstrong, G. G. *See* Guyton, A. C., 4957

Arnikar, H. J. A note on Joshi effect, 5438

Arnold, J. R. *See* Anderson, E. C., 4627

Arnold, J. S. An electromagnetic flowmeter for transient flow studies, 4146

Arnold, J. T., Dharmatti, S. S. and Packard, M. E. Chemical effects on nuclear induction signals from organic compounds, 5663

Arnold, R. D. and Hoge, H. J. A test of ideal solution laws for H_2, HD, and D_2. Vapor pressures and critical constants of the individual components, 878

Arnold, W. R. A 500-kilovolt linear accelerator using selenium rectifiers, 1116. Angular correlation in the reaction $F^{19}(p, \alpha)O^{16*}(\gamma)O^{16}$, 1301

Arnous, E. On the coherent scattering of X-rays by atoms and the influence of shielding by the electrons. I–II, 4417

Arnous, E. and Zienau, S. General theory of damping phenomena for non-stationary processes. I. Fundamentals, and connection with the *S*-matrix formalism, 9272

Arnulf, A., Dupuy, O. and Flamant, F. Microfluctuations of accomodation of the eye and visual acuity for natural pupil diameters, 4966. Microfluctuations of the eye and their influence on the retinal image, 4967

Arpiarian, N. Quenching action of iron on luminescent zinc sulphide, 9391

Arroe, O. H. Hyperfine structure and isotope shift in barium, 183

Artemov, K. P. and Vlasov, N. A. γ-Rays in the reaction $Be^9(\alpha, n)C^{12}$, 6450

Arthur, J. B. *See* Putley, E. H., 9470

Artman, R. A. and Thompson, D. O. The elastic parameters of beta-brass, 3817

Artmann, K. Refraction and reflection of a sideways limited light wave on the plane surface of separation between two media in the neighbourhood of the grazing angle of total reflection, 5307. The reflection of a sideways limited light wave at a thin medium at some distance from the grazing angle of total reflection, 5308

Artsdalen, E. R. Van. *See* Van Artsdalen, E. R.

Arzhanykh, I. S. Integral equations for the deformation vector in the statics of an iostropic elastic body, 3813

Ascoli, G. Relation between π- and μ-meson production spectra in the atmosphere, 413

Asher, H. A d.c.-a.c. amplifier for use in physiology, 8387

Asher, W. R. *See* Maddin, R., 1553

Ashkin, A. *See* DeWire, J. W., 5772, 8178

Ashkin, J., Simon, A. and Marshak, R. On the scattering of π-mesons by nucleons, 5795

Ashmore, A. and Raffle, J. F. Magnetic analysis of α-particle groups from (d, α) reactions, 9695

Ashmore, P. G. and Norrish, R. G. W. A study of sensitized explosions. VIII. Experimental work on the hydrogen-oxygen reaction sensitized by chloropicrin, 690. IX. Experimental work on the sensitization of ignitions of hydrogen-chlorine mixtures by chloropicrin, 691. A study of sensitized explosions. X. The kinetics of decomposition of chloropicrin and of the hydrogen-oxygen and hydrogen-chlorine reactions sensitized by chloropicrin, 2117

Ashton, J. P. The design of commercial hearing aids, 5215

Ashwell, D. G. The axis of distortion of a twisted elastic prism, 8270

Ashwell, G. E. *See* Ross, W., 7135

Aslakson, C. L. and Fickeissen, O. O. The effect of meteorological conditions on the measurement of long distances by electronics, 3307

Aspinall, A., Clegg, J. A. and Hawkins, G. S. A radio apparatus for the delineation of meteor radiants, 5989

Asselt, R. Van. *See* Van Asselt, R.

Astoin, N. Concave grating spectrograph with grazing incidence in vacuum for the far ultra-violet, 8619. *See also* Vodar B., 1718

Aston, J. G. and Mastrangelo, S. V. R. The anomalous first layer of adsorbed helium and a modified B.E.T. theory, 9090

Åström, E. On waves in an ionized gas, 1944

Atack, D. and Schneider, W. G. Solubility measurements in the critical temperature region. I, 1799

Ataka, Y. On the nuclear potential in the meson theory, 8511

Aten, A. H. W., Jr. Reactions of the hydroxyl [radical], 7333

Aten, J. B. T. and Barendregt, F. The efficiency of a uranium-X-separation method, 2961

Atkins, K. R. The flow of liquid helium II through wide capillaries, 9430

Atkins, K. R. and Chase, C. E. The velocity of first sound in liquid helium, 9431

Atkins, K. R. and Osborne, D. V. The velocity of second sound below 1°K, 1017

Atkinson, L. F. Use of Stresscoat and strain gauges in motor industry, 100

Atoji, M. *See* Watanabe, T., 1508

Atta, C. M. Van. *See* Van Atta, C. M.

Atteberry, R. W. *See* Cobble, J. W., 2955

Atterling, H. Design of acceleration chamber and dees for the 225 cm cyclotron at the Nobel Institute for Physics, Stockholm, 3575

Atterton, D. V. and Hoar, T. P. Surface tension of liquid metals, 6064

Attwood, S. S. Surface-wave propagation over a coated plane conductor, 4545

Aubertin, F. *See* Crussard, C., 7439

Audsley, A. and Goss, F. R. Atom polarisation. I. The solvent-effect theory and its application to the molecular refraction and polarisation of *n*-paraffins in the liquid state, 2663

Auer, P. L. *See* Kirkwood, J. G., 4137

Aufenkamp, D. On the impossibility of a stationary closed universe [with zero cosmological constant], 3316

Auluck, F. C. *See also* Agarwala, B. K., 2397

Auluck, F. C. and Kothari, L. S. A note on Riesz potential, 5092. Electrostatic fields in white dwarf stars, 7492

Aurén, T. E. Studies of solar radiation, 9848

Aurivillius, B. Mixed oxides with layer lattices. III. Structure of $BaBi_4Ti_4O_{15}$, 1512. X-ray investigations on $BiNbO_4$, $BiTaO_4$ and $BiSbO_4$, 6593

Aust, K. T. and Chalmers, B. Surface energy and structure of crystal boundaries in metals, 2077

Austern, N. The mechanism of *nD* capture, 8982. *See also* Sachs, R. G., 4094

Austern, N. and Sachs, R. G. Interaction effects on radiative transitions in nuclei, 4095

Austin, A. E. and Schwartz, C. M. Modification of a positive-replica technique for electron microscopy, 6502

Auty, R. P. *See* Davidson, D. W., 9449

Avakyants, G. M. On the exchange effect of γ-rays with the deuteron, 7238. On the electromagnetic radiation during neutron-proton collision, 8527

Averbach, B. L. X-ray detection of long-range order in Ni_3Mn, 9019. *See also* Flinn, P. A., 9736; Lement, B. S., 4331

Avery, D. G. Some optical properties of evaporated layers of silver, copper and tin, 227

Avery, E. *See* Smaller, B., 8803

Avery, R. *See* Blanchard, C. H., 2917

Avgul, N. N., Dzhigit, O. M., Dreving, V. P., Gurev, M. V., Kiselev, A. V. and Likhacheva, O. A. Absolute adsorption isothermals of vapours on quartz and silica gels of various structures, 6546

Avignon, P. On the branching of AcA and the long range radiation from actinium active deposit, 1265

AUTHOR INDEX

Avignon, Y. *See* Renardier, M., 9527

Awano, T. On the negative energy photon hypothesis, 1611

Axel, P. Isomers and shell structure, 1249. *See also* Mann, L. G., 2960

Axford, D. W. E., Janz, G. J. and Russell, K. E. Infrared and Raman spectra of methylhydrazine and symmetrical dimethylhydrazine, 6859

Axilrod, B. M. Triple-dipole interaction. I. Theory, 6376; II. Cohesion in crystals of the rare gases, 6373

Ayant, Y. On the paramagnetic properties of solutions of iron and cobalt salts, 5583. The magnetic field acting on an ion in an aqueous solution of ferrous and cobaltous salts, 5584. Graphical representation of the integral solution of Bloch's equations, 8533. *See also* Grivet, P., 5574; Soutif, M., 9634

Ayre, R. S., Jacobsen, L. S. and Phillips, A. Steady forced vibration of a non-conservative system with variable mass; a pumping system, 900

Ayres, E. and Thomas, C. A. What are the prospects for industrial nuclear power? 2057

Azcona, J. M. López de. *See* López de Azcona, J. M.

Azimov, S., Birger, N., Dobrotin, N., Zhdanov, G., Kokurin, Yu. and Slavatinskiĭ, S. On the masses of cosmic ray particles, 9568

Azimov, S. A. and Vishneskiĭ, V. F. On the disintegration of particles generating electro-nuclear showers, 8814

Azou, P. *See* Bastien, P., 3824

Baade, W. *See* Spitzer, L., Jr, 5043

Baas, G. *See* Rathenau, G. W., 5904

Babbitt, J. D. On the differential equations of diffusion, 123

Babiskin, J. A float for liquid helium, 2621

Babits, V. and Hicks, H. F., Jr. Electrical color filters, 1779

Babits, V. A. Graphical method for synthesis and resolution of luminous colour mixtures, 1001

Bachman, C. H., Eubank, H. and Hall, G. Hollow cathode for positive ion studies in cathode-ray tubes, 9563

Back, F. G. Lens tester for photographic lenses, 174

Backofen, E. W. *See* Maletskos, C. J., 6443

Bäckström, H. Estimation of tenths of scale readings, 3310

Backus, J. The design of cyclotron oscillators, 4447

Bacon, G. E. X-ray and neutron diffraction by graphite layers, 3208

Bacon, G. E., Smith, J. A. G. and Whitehead, C. D. Some mechanical features of a double-crystal neutron spectrometer, 2072

Bacon, R. H. The pursuit course, 60. Motion relative to the surface of the rotating earth, 4123

Baddeley, G. and Chadwick, J. The effect of intramolecular configuration on the rate of unimolecular solvolysis of aralkyl chlorides, 4822

Badger, R. M. *See* Hedberg, K., 5284; Jones, L. H., 2906; Newman, R., 8636

Baeckmann, W. von. *See* von Baeckmann, W.

Baenziger, N. C. The crystal structure of $NaAlCl_4$, 6588

Baetslé, P. L. Systematization of numerical matrix calculations, 5971

Bagaryatskiĭ, Yu. A. Calculation of the intensity of diffuse scattering of X-rays for ageing alloys, 6570

Bagge, E. On the interpretation of Hubble's expansion law for the universe, 2310. On the origin of cosmic rays, 2780

Bagguley, D. M. S. and Griffiths, J. H. E. Paramagnetic resonance in chromic sulphate alums at room temperature, 1931

Bagno, O., Longuet-Escard, J. and Mathieu-Sicaud, A. Electron microscopy of nickel hydroxide sols, 5876

Bagnold, R. A. The movement of a cohesionless granular bed by fluid flow over it, 3370. Measurement of very low velocities of water-flow, 7592

Bailey, M. and Wells, A. F. The structures of inorganic oxy-acids: the crystal structure of selenic acid [anhydrous], 5925

Bailey, R. *See* Naismith, R., 1538, 2207

Bailey, R. A. *See* Eméléus, K. G., 537

Bailey, V. A. The relativistic theory of electro-magneto-ionic waves, 7125

Bailly, R. Prismatic cleavage of molybdenite, 1489

Bainbridge, K. T. The isotopic weight of helium, 4598. *See also* Bartlett, A. A., 7937; Purcell, E. M., 8184

Bainbridge-Bell, L. H. An anistropic drafting device, 4998

Bair, J. K. *See also* Maienschein, F. C., 8941

Bair, J. K. and Maienschein, F. C. Scintillation spectra of As^{76}, 4680. Three-crystal scintillation spectrometer, 6440. Erratum, 9673

Bair, J. K., Maienschein, F. C. and Baker, W. B. Two crystal spectrometer results with uncollimated γ-rays, 4671

Baird, D. H., Fristrom, R. M. and Sirvetz, M. H. Stark effect absorption cells for microwave spectroscopy, 9317

Baize, P. A new correction formula for the determination of the magnitude differences between the components of double stars from visual estimates, 7475

Bak, B., Sloan, R. and Williams, D. Microwave investigation of SCSe, 950

Baker, E. B. The double super-heterodyne principle applied to dielectric measurements, 4369. A micro-inch micrometer of one-tenth inch range, 6765. Automatic measurement computation and recording of dielectric constant and loss factor against temperature, 6954

Baker, R. F. *See* Vold, R. D., 4788

Baker, R. G. *See* Katz, L., 5770

Baker, W. B. *See* Bair, J. K., 4671; Maienschein, F. C., 8941

Baker, W. D., Howell, J. S., Goodman, C. and Preston, W. M. The (p, n) reaction on scandium and vanadium: energy levels of Ti^{46} and Cr^{52}, 3002

Bakker, C. J. *See also* Nijgh, G. J., 9661; Verster, N. F., 8933

Bakker, C. J. and Segrè, E. Stopping power and energy loss for ion pair production for 340-MeV protons, 4456

Bakore, G. V. An explanation of the influence of the frequency of the exciting potential on Joshi effect, 340. A note on Joshi effect, 5437

Balabukha, D. K. *See* Gorokhovskiĭ, Yu. N., 9906

Balasse, G. and Lemmens, M.-L. Continuous emission spectra of mercury, 6107

Balasubrahmanyam, V. K. *See* Rao, A. S., 7991

Balázs, N. L. Viscosity of binary liquid mixtures, 7584

Baldin, A. M. and Mikhaĭlov, V. V. Production of single mesons by γ-quanta, 8987

Baldinger, E. *See also* Haeberli, W., 1140; Meyer, K. P., 1267; Ricamo, R., 1324

Baldinger, E., Huber, P., Ricamo, R. and Zünti, W. Angular distribution of neutrons elastically scattered by oxygen, carbon and nitrogen, 1323

Baldock, G. R. *See* Coulson, C. A., 1406

Baldwin, E. M. Neutron-proton scattering in the energy range of 18 to 21 MeV, 8235

Balent, R. *See* Iverson, H. W., 3372

Ball, A. F. *See* Douglas, T. B., 5369

Ball, J. G. and Adams, E. T. A method of temperature programme control for thermal analysis, 2640

Ball, W. P. *See* Richardson, R. E., 8963

Ballabh, R. On a fluid motion with a spherical boundary, 9296

Ballantine, H. T., Jr, Bolt, R. H., Hueter, T. F. and Ludwig, G. D. Detection of intracranial pathology by ultrasound, 2266

Ballard, L. A. T. A simple device for controlling relative humidity, 128

Ballard, S. S. Proposal of the International Commission of Optics for international standardization of sign conventions and symbols in geometrical optics, 4224. *See also* Combes, L. S., 4229

Ballard, S. S., McCarthy, K. A. and Davis, W. C. A method for measuring the thermal conductivity of small samples of poorly conducting materials such as optical crystals, 2599

Ballario, C., Brunelli, B., De Marco, A. and Martelli, G. On the diurnal variation of extensive air showers of high density at 3 500 m above sea level, 8008. Diurnal variation of dense extensive showers at 3 500 m altitude, 9575

Balseiro, J. A. Transformation of configurations of a radiation field. Application to the radiation of multipoles, 3323

Balsley, J. R. Techniques and results of aeromagnetic surveying, 6618

Baltá Elias, J. Problems presented by cosmic radiation at the present time, 7989

Baltensperger, N. Contribution to theory of impurity centers in silicon, 9475

Bamford, C. H., Bamford, D. and Collins, J. R. Kinetic studies on carbohydrates in alkaline conditions. II. The kinetics of the rearrangements of glucose and fructose in alkaline solution, 2121

Bamford, C. H. and Collins, J. R. Kinetic studies on carbohydrates in alkaline conditions. I. The kinetics of the autoxidation of glucose, 2120

Bamford, C. H. and Hanby, W. E. Structure of synthetic polypeptides and proteins, 9837

Bamford, C. H., Hanby, W. E. and Happey, F. The structure of synthetic polypeptides I. X-ray investigation, 3171; III. The molecular configurations and physical properties of some regenerated synthetic polypeptides, 5889

Bamford, D. *See* Bamford, C. H., 2121

Banbury, P. C., Gebbie, H. A. and Hogarth, C. A. Semi-conducting materials. Crystal triode action in lead sulphide, 7889

Bancie-Grillot, M. *See* Grillot, E., 967

Band, W. Condensation phenomena in a clustering Bose–Einstein gas, 99. Non-equilibrium phenomena in a Bose–Einstein gas. II. Heat transfer, 263. Debye modes and superconductivity, 321, 1064. On the origin of the lighter elements, 2304. Mobile multilayer adsorption of a Bose–Einstein gas: helium, 4345

Bandel, H. W. Corona from ice points, 7915. Point-to-plane corona in dry air, 9504

Bandyopadhyay, G. A strange feature of Einstein's most recent generalized field theory, 6016. *See also* Majumdar, S. K., 2679

Banerjea, B. K. *See* Saha, M. N., 8860

Banerjee, B. M. and Roy, R. A time base circuit for a high precision ionospheric sounding apparatus, 3968

Banerjee, K. and Maitra, J. C. On a method of studying small-angle scattering of monochromatic X-rays, 9824

Banerjee, S. S. and Rajan, V. D. Long distance scattering of radio signals, 8855

Banerjee, S. S., Rajan, V. D. and Mehrotra, R. R. Intensity of scattered radio signals from distant transmitters, 8856

Banks, C. V. *See* Godycki, L. E., 9179

Baños, A., Jr, Saxon, D. S. and Gruen, H. Propagation characteristics in a coaxial structure with two dielectrics, 2857

Bär, M. *See* Allen, W. D., 1851

Baranova, N. A. *See* Shur, Ya. S., 1934, 2839

Baranovskaya, N. V. *See* Gerling, E. K., 6399

Barber, W. C. Short-lived isomers of Ta^{181}, 2941

Barbezat, S. *See* Trillat, J.-J., 2186, 4911

Barbier, D. and Williams, D. R. Observations of the aurora borealis, 2223

Barbier, J. C. Irreversible [magnetic] viscosity in weak fields, 6325

Barbour, I. Emulsion studies of cosmic-ray stars produced in metal foils, 5544

Barchewitz, P. Perturbations in the region of infra-red absorption, 6853. *See also* Garach, J., 9373

Barchewitz, P. and Chabbal, R. The absorption frequencies of CH and their perturbations. I. Experimental study, 9372

Barchukov, A. I. *See* Podgoretskiĭ, M. I., 429

Barcia Goyanes, C. Detection and estimation of thorium, 8324. *See also* Govaerts, J., 9803

Barclay, G. A. *See also* Angyal, C. L., 2900

Barclay, G. A., Le Fèvre, R. J. W. and Smythe, B. M. The dependence on state of the apparent dipole moments of ethylamine, diethylamine and triethylamine, 1036. The variation of dipole moment with state for *n*-propyl- and *n*-butyl-amines, with notes on the apparent moments in solution of certain other amines, 8883

Bardeen, J. Theory of relation between hole concentration and characteristics of germanium point contacts, 1058. Wave functions for superconducting electrons, 1846. Relation between lattice vibration and London theories of superconductivity, 4396. Choice of gauge in London's approach to the theory of superconductivity, 5420. Field variation of superconducting penetration depth, 5421. Criterion for superconductivity, 7905. *See also* Hall, H. H., 9477

Bardeen, J. and Shockley, W. Deformation potentials and mobilities in non-polar crystals, 1057. Scattering of electrons in crystals in the presence of large electric fields, 1108

Barden, S. E. A note on resonance damping, at injection, in betatrons and synchrotrons, 3556. On resonance damping at injection in betatrons and synchrotrons, 7945

Bardolle, J. *See also* Bénard, J., 8338

Bardolle, J. and Bénard, J. On the existence of a nucleation process in the controlled oxidation of iron at high temperatures, 3193

Bardsley, O. The conditions at a sharp leading edge in supersonic flow, 3401

Bardlsey, O. and Mair, W. A. The interaction between an oblique shock-wave and a turbulent boundary-layer, 2451

Bardsley, W. *See* Tolansky, S., 3407

Bardwell, J. and Hinshelwood, C. The cool flame of methyl ethyl ketone, 3496. The kinetics of the oxidation of gaseous methyl ethyl ketone. I, 7330; II, 7331

Barenblatt, G. I. Solution of the equation of thermal conductors with a non-homogeneous boundary condition, 2596

Barendregt, F. *See* Aten, J. B. T., 2961

Barer, R. 'Phase-contrast' methods and birefringence, 6160. Aspects of ultra-violet and infra-red microspectrography with the Burch reflecting microscope, 7662. *See also* Perutz, M. F., 7733*

Barer, R. and Saunders-Singer, A. E. A low power micromanipulator and microdissector, 3476

Barham, P. M. *See* Hopkins, H. H., 247

Barieau, R. E. The correct application of the Gibbs–Helmholtz equation to reversible galvanic cells in which several phases are in equilibrium at one of the electrodes, 699. *See also* Giauque, W. F., 2647

Barieau, R. E. and Giauque, W. F. $ZnSO_4.7H_2O$. $ZnSO_4.6H_2O$. Heat capacities, entropies and crystal perfection at low temperature. Heats of solution and transition, 2646

Barinskiĭ, R. L. *See also* Vaĭnshteĭn, E. E., 9513–14, 9516

Barinskiĭ, R. L., Narbutt, K. I. and Vaĭnshteĭn, E. E. Correlation between the theory of the fundamental X-ray absorption edge and the fine-structure theory, 9515

Barit, I. Ya. and Podgoretskiĭ, M. I. The statistical theory of errors in measurements with the ionization chambers, 5494

Barkas, W. H., Smith, F. M. and Gardner, E. Meson to proton mass ratios, 6473

Barker, D. B. *See* Huibregtse, E. J., 9463

Barker, E. C. *See* Snell, A. H., 2048

Barker, K. H. *See also* Armenteros, R., 6297

Barker, K. H. and Butler, C. C. The nuclear interaction length of the particles in penetrating cosmic-ray showers, 2796

Barker, P. R. An unusual nuclear event, 3618

Barlow, H. M. An instrument to demonstrate the synthesis of a wave-guide mode of propagation, 1202

Barnard, A. J., Luthra, S. P., Newitt, D. M. and Pai, M. U. Two-phase equilibrium in binary and ternary systems, 9758

Barnard, V. The approximate mean height of the thundercloud charges taking part in a flash to ground, 8386

Barnes, B. T. *See also* Kenty, C., 7922

Barnes, B. T. and Eros, S. Techniques for measuring the dynamic characteristics of low pressure discharge, 1073

Barnes, R. S. Diffusion of copper along the grain boundaries of nickel, 2081. A simple temperature-controlled laboratory furnace, 3499

Barnes, S. W. *See* Ingram, M., 4009

Barnett, M. P. and Coulson, C. A. The evaluation on integrals occurring in the theory of molecular structure. I–II, 3252

Barnóthy, J. and Forro, M. Coincidence methods of measuring disintegration rates of radioactive sources, 8159

Baroin, M. and Schatzman, E. The calculation of a model of a turbulent stellar atmosphere, 819
Baron, M. *See* Harper, R., 3265
Barone, A. An optical method for measuring the velocity of longitudinal and transverse ultrasonic waves in solids, 6800
Barone, A. and Nuovo, M. Ultrasonic intensity measurement, 6814
Baroni, G. and Castagnoli, C. Application of the electron microscope to the study of photographic processes, 1555
Baroody, E. M. The application of Wooldridge's theory of secondary emission, 8777
Barr, A. E. De. *See* De Barr, A. E.
Barr, W. J. and Wilson, E. J., Jr. Calculated thermochemical properties for hydrazine-hydrogen peroxide reaction at high pressures, 4811
Barredo, J. G. Fast electrode reactions, 9066
Barredo, J. M. Gonzalez. *See* Gonzalez Barredo, J. M.
Barrell, H. The dispersion of air between 2 500 Å and 6 500 Å, 5239. Comparisons of wave-length standards emitted by mercury-198 lamps, 9363
Barrell, H. and Preston, J. S. An improved beam divider for Fizeau interferometers, 2579
Barrell, H. and Teasdale-Buckell, P. The correction for dispersion of phase change in Fabry–Perot interferometers, 6143
Barrer, R. M. Hutting's multilayer isotherm, 9088
Barrer, R. M. and Grove, D. M. Flow of gases and vapours in a porous medium and its bearing on adsorption problems. I. The steady state of flow, 8570; II. Transient flow, 8571
Barrer, R. M. and Robins, A. B. Multilayer sorption in terms of an equation of state, 9089
Barrère, G. The theoretical efficiency of X-ray counters, 5486. New emissions in the X-ray spectra of tungsten and mercury, 9512
Barret, P. A mechanical surface effect during spark electrolysis, 3140
Barrett, E. W., Herndon, L. R., Jr and Carter, H. J. Some measurements of the distribution of water vapor in the stratosphere, 4936
Barrett, J. H. Upper limit on the cross section for the scattering of neutrinos, 649
Barrett, R. E. *See* Smith, M. C., 4189
Barrow, G. M. Remarks on the interpretation of the CH_2 vibrational frequencies of *n*-paraffins, 4252
Barrow, R. F. *See* Andrews, E. B., 6112; Dovell, W. H., 2521; Lagerqvist, A., 188; Laird, R. K., 972; Welti, D., 9376
Barrucand, P. A. The Mellin transform and its applications, 1561
Barschall, H. H. Studies of nuclear energy levels with fast neutrons, 3782. *See also* Bockelman, C. K., 9710; Coon, J. H., 3037; Henkel, R. L., 1310; Johnson, C. H., 3028, 6465; Peterson, R. E., 627–8
Barshchevskiĭ, B. On the character of light absorption in silver halide layers, 1764. Connection between the internal photo effect and light absorption in silver halide salts, 7899. Absorption of light, internal photo-effect, and photographic sensitivity in silver iodide, 9222
Barshchevskiĭ, B. and Lavrenchik, V. Image formation by electrographic means, 7829
Barst, A. O. The cathode field in diodes under partial space-charge conditions with initial velocities, 4479
Bartberger, C. L. The magnetic field of a plane circular loop, 484
Bartell, F. E. *See* Fu, Y., 8999
Bartell, F. O., Helmholz, A. C., Softky, S. D. and Stewart, D. B. Excitation functions for spallation reactions on Cu, 3015
Bartels, H. A new method of temperature measurement in high pressure arc columns. II, 2717. On line emission from the inhomogeneous layer. II, 5240
Bartels, J. Results of geomagnetic *K*-indices for the international polar year 1932–33, 3221
Bartenev, G. M. Approximate theory of the high-elastic deformation of rubber, 2087
Bartenev, G. M. and Vishnitskaya, L. A. High-elasticity characteristics of non-crystallized rubber, 2088
Barthélemy, R. Measurement of secondary emission from insulators, 2753
Bartholdson, I. The angular distribution of the D–D neutrons, 611
Bartholdson, I. and Carlson, G. A 200-kV neutron generator. II, 1321
Bartholomew, G. A. *See* Kinsey, B. B., 3032, 3752, 5728, 8177; Millar, C. H., 3741
Bartlett, A. A. and Bainbridge, K. T. A high resolution two-directional focusing beta-ray spectrometer, 7937
Bartlett, T. W. Determination of uranium in solution by X-ray absorption, 8330
Barton, G. W., Jr. *See also* O'Kelley, D. G., 1992
Barton, G. W., Jr, Ghiorso, A. and Perlman, I. Radioactivity of astatine isotopes, 4655
Barton, G. W., Jr, Robinson, H. P. and Perlman, I. The *L* X-ray spectra of radioactive decay of transuranium elements, 3750
Barton, J. C., George, E. P. and Jason, A. C. Observations of slow mesons and nuclear disintegrations in photographic plates exposed under carbon absorbers, 2815
Barut, A. O. The cathode field in diodes under partial space-charge conditions with initial velocities, 4479. The transit time, electron paths, cathode field strength and potential in a space-charge diode for any initial electron velocity and direction, and current, 4481
Barwell, F. T. and Milne, A. A. Lubrication with materials in the solid state, 3838. The lubrication of rough steel surfaces by a series of metallic soaps, 3839
Basak, B. S. Crystal structure of phenanthrene, 1516
Bashilov, A. A. *See* Antoneva, N. M., 3728, 6430; Dzhelepov, B. S., 4427
Bashkin, S. and Goldhaber, G. A note on thin nickel foils, 5816
Bashkin, S., Mooring, F. P. and Petree, B. Total cross section of helium for fast neutrons, 5788
Baskova, K. A. and Dzhelepov, B. S. A comparative study of the absorption of mono-energetic positrons and electrons, 8775
Basri, S. *See* Messiah, A. M. L., 8225
Bass, A. M. Fluorescence studies of some simple benzene derivatives in the near ultraviolet. II. Toluene and benzonitrile, 974
Bass, J. Correlation of space and time in homogeneous turbulence, 6771
Basset, Jac. and Basset, Jas. The rate of burning of powders at pressures up to 10 000 kg/cm², 1012. Detonation of secondary explosives by an electric spark, and remarks on a note by R. Schall on the same subject, 6526
Basset, Jas. *See* Basset, Jac., 1012, 6526
Basset, Y. On the indices of mixtures of two transparent bodies in the form of a thin film, 3427
Bassi, P., Clementel, E., Filosofo, I. and Puppi, G. On the positive excess of mesons at sea-level, 474
Bassi, P., Filosofo, I., Manduchi, C. and Prinzi, L. Positive excess of mesons at 2 000 metres, 8815
Baş-Taymaz, E. Remark on an aberration-phenomenon in electrostatic lenses. "Kidney Effect," 364. The life of a heated tungsten spiral and the evaporation rate of tungsten in high vacuum, 408. Measurement of electron emission from the tungsten-carbon and molybdenum-carbon systems, 4487. On a new high current electron gun with an indirectly heated tungsten cathode, 5512
Bastian, R., Weberling, R. and Palilla, F. Electrolytic determination of cadmium in zinc sulfide-cadmium sulfide phosphors, 9107
Bastien, P. and Azou, P. Influence of the amplitude and of the speed of plastic deformation on the segregation of hydrogen in iron and steels, 3824
Basu, S. Study of the optical properties of shellac solutions, 1775. Viscosity of sodium thymonucleate, 9294
Batchelder, F. W. Von. *See* Von Batchelder, F. W.
Batchelor, G. K. Diffusion in a field of homogeneous turbulence. I. Eulerian analysis, 124. Pressure fluctuations in isotropic turbulences, 5146
Bateman, L., Bolland, J. L. and Gee, G. Determination of absolute rate constants for olefinic oxidations by measurement of photochemical pre- and after-effects. II. At "low" oxygen pressures, 9057

Bateman, L., and Gee, G. Determination of absolute rate constants for olefinic oxidations by measurement of photo-chemical pre- and after-effects. I. At "high" oxygen pressures, 4853

Bates, D. R. A suggestion regarding the use of rockets to vary the amount of atmospheric sodium, 2226. Recombination and the helium afterglow spectrum, 5252. The oscillator strength of H_2^+, $1s\sigma$–$2p\sigma$, 8877. The temperature of the upper atmosphere, 9850

Bates, D. R., Fundaminsky, A., Leech, J. W. and Massey, H. S. W. Excitation and ionisation of atoms by electron impact—the Born and Oppenheimer approximations. II, 1890

Bates, D. R., Fundaminsky, A. and Massey, H. S. W. Excitation and ionisation of atoms by electron impact—the Born and Oppenheimer approximations. I, 1890

Bates, D. R. and Nicolet, M. The photochemistry of atmospheric water vapor, 1534. Theoretical considerations regarding the altitude of the layer responsible for the nocturnal emission of the sodium *D*-lines, 2224

Bates, D. R. and Spitzer, L., Jr. The density of molecules in interstellar space, 6682

Bates, H. G. C., Evans, M. G. and Uri, N. Oxidation by photochemical electron transfer oxidation, 2133

Bates, L. F. Recent ideas and experiments in magnetism. I, 5548. Elementary domains in a single crystal of cobalt, 6323. Determination of the width of elementary domains in a single crystal of iron-silicon, 7078. The thermal effects associated with magnetization processes, 7105

Bates, L. F. and Davis, J. H. Heat changes accompanying magnetization in low and moderate fields: the effects of strain, and theoretical interpretation, 1191

Bates, L. F. and Wilson, G. W. Some new Bitter patterns on a single crystal of nickel, 8044

Bates, R. G. Determination of dissociation constants in a mixture of two weak acids by electromotive force measurements, 8292. *See also* Pinching, G. D., 5860

Bates, R. G., Pinching, G. D. and Smith, E. R. *p*H standards of high acidity and high alkalinity and the practical scale of *p*H, 3134

Bateson, H. M. Some views on the breaking of glass derived from the examination of fracture surfaces, 1382

Bateson, W. O. Proton groups from the deuteron bombardment of boron, 3013

Båth, M. An investigation of the Uppsala microseisms, 7396. The microseismic importance of cold fronts in Scandinavia, 7397

Batsch, H. *See* Tonnelat, J., 1778

Battell, W. J. *See* Moody, N. F., 7973, 9553–4

Batzel, R. E. and Seaborg, G. T. Fission of medium weight elements, 604, 5734

Baudean, J. E. *See* Riess, K., 4143

Baudoux, P. Note on surface currents, 504

Baudyš, M. C.I.E. chromaticity co-ordinates, 9404

Bauer, E. The energy loss of free magnetic poles in passing through matter, 8833

Bauer, F. L. The shell model of atomic nuclei, 7176

Bauer, G. On the use of alternating light in thermal radiation receivers, 9354

Bauer, H. A. Fundamentals of atomic physics, 8111

Baum, F. J. Transmittance measurement of samples of small area with the Hardy recording spectrophotometer, 6118

Baum, W. A. and Dunkelman, L. Ultraviolet radiation of the high pressure xenon arc, 1788

Baumgartner, H. Phenomena of electrical saturation and pyroelectric effect in potassium phosphate, KH_2PO_4, 2674

Baumgartner, W. *See* Schaetti, N., 317

Bauple, R., Gilles, A., Romand, J. and Vodar, B. Absorption spectra of samples of quartz and corundum in ultraviolet. Electric and thermic treatment of quartz, 2525

Baur, F. Latest discoveries of main weather features, 2217

Bauwens, P. The analysis of action potentials in electromyography, 1550

Bavelas, A. Communication patterns in task-oriented groups, 2480

Bawn, C. E. H. High polymer solutions. V. Effect of concentrations on the viscosity of dilute solutions, 4874

Bawn, C. E. H., Freeman, R. F. J. and Kamaliddin, A. R. High polymer solutions. II. The osmotic pressures of polystyrene solutions, 4871; III. The relation between viscosity and molecular weight for polystyrene fractions in benzene, toluene, chloroform, ethyl benzene and methyl ethyl ketone, 4872

Bawn, C. E. H., Grimley, T. B. and Wajid, M. A. High polymer solutions. IV. The intrinsic viscosity-molecular weight relationships in mixed solvents, 4873

Baxendale, J. H. and Enüstün, B. V. A thermodynamical investigation of the system benzene-diphenyl. II–IV, 1388

Baxendale, J. H., Enüstün, B. V. and Stern, J. A thermodynamical investigation of the system benzene-diphenyl. I, 1388

Baxter, A. D. Combustion in the rocket motor, 6764

Bay, Z. A new type of high speed coincidence circuit, 7039

Bay, Z., Meijer, R. R. and Papp, G. On measuring very short half-lives, 6406

Bayet, M. On the different regimes of gaseous electrical discharges, 3542. On the light emission accompanying electrical excitation of the rare gases—the case of helium, 4482

Bayley, S. T. The dielectric properties of various solid crystalline proteins, amino acids and peptides, 8713. The dielectric properties of adsorbed water layers on inorganic crystals, 8714

Bayliss, N. S. Conjugated compounds. II. Simple potential energy functions, absorption spectra, and ionization in linear polyenes, 1223. The permicron: a unit of wave number, 4070

Bayly, J. G. A colorimetric measurement of the disintegration rate of a P^{32} source, 1262

Bazarov, I. P. *See* Vlasov, A. A., 6990

Bazhenov, G. M. Some applications of matrices in celestial mechanics, 1571

Beach, L. A. *See* DeWire, J. W., 5772, 8178, 8950

Beakley, W. R. The design of thermistor thermometers with linear calibration, 6180

Beale, R. N. and Roe, E. M. F. An apparatus for quantitative low temperature ultra-violet absorption spectroscopy, 5245

Beals, C. S. The atmospheres of the early type stars, 4059

Beams, J. W. and Morton, H. S., Jr. Transmission line Kerr cell, 4372

Beams, J. W., Ross, J. D. and Dillon, J. F. Magnetically suspended vacuum-type ultra-centrifuge, 4122

Bear, R. S. and Bolduan, O. E. A. Periodic statistical distortion of unidirectionally ordered diffractors, with application to collagen, 3077

Beard, C. I. and Dailey, B. P. The structure and dipole moment of isothiocyanic acid, 2905

Beard, D. B. and Bethe, H. A. Field corrections to neutron-proton scattering in a new mixed meson theory, 8524

Beard, D. S., Cox, E. G. and Sutton, G. J. A new equi-inclination Weissenberg X-ray goniometer, 8349

Bearden, J. A., Johnson, F. T. and Watts, H. M. A new evaluation of h/e by X-rays, 2357; Erratum, 7173

Bearden, J. A. and Schwarz, G. A precision evaluation of h/e by X-rays, 1084

Bearden, J. A. and Watts, H. M. A re-evaluation of the fundamental atomic constants, 2356; Erratum, 7501. A new formulation of the least-squares calculation of atomic constants, 3308

Beasley, J. K. *See* Harris, L., 8657

Beattie, J. A., Douslin, D. R. and Levine, S. W. The vapor pressure and critical constants of neopentane, 6923

Beattie, J. W. *See* Laughlin, J. S., 7438, 8766

Beatty, R. E., Jr. Attenuation of $(n, 0)$ transverse mode in a rectangular tube, 148. Boundary layer attenuation of higher order modes in rectangular and circular tubes, 1670; Erratum, 6798

Beauclair, W. de. *See* de Beauclair, W.

Beaugé, R. *See* Ertaud, A., 8211

Beauregard, O. Costa de. *See* Costa de Beauregard, O.

Beaven, G. H., Holiday, E. R. and Jope, E. M. The ultra-violet absorption spectra of the aromatic amino acids in proteins and related compounds, 9379

Beaverson, W. A. and Wiggins, A. M. A second-order gradient noise canceling microphone using a single diaphragm, 157; Erratum, 6087

Bechert, K. Attempts at a non-linear electrodynamics, 73

Bechmann, R. Contour modes of square plates excited piezoelectrically and determination of elastic and piezoelectric coefficients, 5174

Bechmann, R. and Parsons, P. L. Piezoelectric behaviour of partially square plates vibrating in contour modes, 7844

Beck, C. A. Near ultraviolet absorption spectrum of hydroquinone, resorcinol, and catechol, 206

Beck, C. K. Nuclear reactor project at North Carolina State College, 3783

Beck, F. The electrodynamic potential in the generalized phenomenological theory of superconductivity, 6978

Beck, M. and Gränicher, H. Electro-optical investigations on single crystals of the KH_2PO_4 group, 297

Becker, A. Quenching of phosphorescence. I, 5293

Becker, A. and Becker, F. Quenching of phosphorescence. III. Quantitative, 5293

Becker, E. W. The thermal de-mixing of gases at high pressures, 896. Effect of pressure on thermal diffusion in gases, 4161

Becker, F. *See* Becker, A., 5293; Hartmann, H., 9628

Becker, G. and Krüger, H. The properties of the nuclear quadrupole moments of copper isotopes, 6385

Becker, G. E. and Caswell, D. A. Operation of a six-MeV linear electron accelerator, 7005

Becker, M. *See* Fan, H. Y., 7882

Becker, R. Dynamics of the Bloch wall and high frequency permeability, 6317

Becker, R. A. *See* Bendel, W. L., 8922; Shore, F. J., 8924

Becker, W. The damping of extra-ordinary components in the ionosphere E_1-layer, 2871. On the evaluation of ionospheric observation, 2872. The optimum illumination of a spectrograph by a homogeneous light-emitting volume, and the minimum volume required, 6161. On the problem of "triple splitting" in the ionosphere, 7130. Distance determination of open clusters using the method of colour differences, 8466

Beckmann, C. O. *See* Jacobson, H., 3177

Becquerel, J. Remarks on the slowing down of time by the effect of a gravitational field, 6721

Bederson, B. *See* Fisher, L. H., 2716; Pohlman, W. B., 8145

Beeck, O. Hydrogenation catalysts, 1408

Beeck, O., Cole, W. A. and Wheeler, A. Determination of heats of adsorption using metal films, 1449

Beeck, O. and Ritchie, A. W. The effect of crystal parameter on hydrogenation and dehydrogenation 1407

Beeman, W. W. *See* Dexter, D. L. 5294; Leonard, B. R., Jr, 7426; Ritland, H. N., 1227

Beers, Y. *See* Korff, S. A., 3279

Beets, S. *See* Morant, M., 1168

Beevers, C. A. *See* Robertson, J. H., 6597

Beghian, L. E. *See also* Bishop, G. R., 9704; Grace, M. A., 7281; Wilson, R., 388

Beghian, L. E., Bishop, G. R. and Halban, H. A high energy X-ray line in the spectrum of Mg^{24}, 7244

Běhounek, F. and Jech, Č. Emanating power and the age of complex silica gels, 2140

Behr, A. On the distance scale for extra-galactic nebulae, 4042. The intensity variation of the green coronal line, 1943–1950, 6699. A photoelectric stellar photometer with secondary electron multiplier, 7455

Behrens, H. Chemical ionization in flames, 7335. Cloud chamber study of the xenon isotopes Xe^{133}, Xe^{135}, 8174

Behrens, H. and Rössler, F. Flame spectra of systems containing oxygen as NO_2, 6108

Behrmann, W. A mechanical shake testing stand [for vibrations] up to 300 c/s with frequency and amplitude continuously variable during operation, 4178

Beiser, A. A slide rule for nuclear emulsion calculations 2280. A thermal mechanism for residual laten image fading in nuclear emulsions, 2283. Laten image fading in nuclear emulsions, 4020. Varyin nuclear emulsion sensitivity with altitude, 4510

Békésy, G. von. *See* von Békésy, G.

Belanger, J. R. *See* Kasper, J. S., 3912

Belcher, E. H. Measurement of gamma-ray energie with the scintillation counter, 1885. Abnorma efficiencies in the scintillation-counting of gamma rays, 2024. Scintillations produced in liquids b high-energy radiation: $\alpha\alpha'$ dinapthyl as a scintillating medium, 3454

Belcher, E. H. and Evans, H. D. A directiona scintillation counter for clinical measurements, 3590

Belenskiĭ, S. Z. Some questions concerning cascade theory, 1908*. Calculation of the moments o distribution function of shower particles, 2779

Bélilovsky, P. *See* Süe, P., 3715

Belinfante, F. J. "Integro-causation" in convergent quantum field theory, 7508

Bell, E. E. *See also* Jones, R., 959; Wood, D. L., 205

Bell, E. E. and Nielsen, H. H. The infra-red spectrum of acetylene, 962; Erratum, 4273

Bell, I. P. *See* Vand, V., 9175

Bell, J. Some aspects of electrical computing. I, 7451

Bell, J. and Langham, E. M. Mean-wind-velocity instruments for use on naval craft, 2199, 9198

Bell, J. F. W. Satellite resonances in ultrasonic interferometry, 906

Bell, P. R. *See also* Francis, J. E., Jr, 4477

Bell, P. R., Cassidy, J. M. and Kelley, G. G. The disintegration scheme of I^{131}, 6412

Bell, P. R. and Straus, H. A. Electronic pile simulator, 630

Bell, R. P. and Caldin, E. F. The kinetics of the base-catalyzed decomposition of nitramide and deuterated nitramide in anisole, 3856

Bell, R. P. and Long, D. A. Polarizability and internuclear distance in the hydrogen molecule and molecule-ion, 529

Bellaire, F. R. and Anderson, L. J. Thermocouple psychrometer for field measurements, 9199

Bellet, E. and Levert, P. An interesting example of adsorption and purification in the solid phase, 3168

Belliboni, G., Fabbrichesi, L., de Marco, L. and Merlin, M. Transition effect of disintegration stars in nuclear plates under thin layers, 8826

Belliboni, G. and Merlin, M. On the study of highly ionizing particles in nuclear plates, 8183

Belluigi, A. The electromagnetic field due to induced currents in a conductive slab of finite dimensions, 1531

Beloselskiĭ, V. The relation between γ-ray energy and half-period in K-capture, 3724

Belov, N. V. The criteria of enantiomorphy, 3186. The theorem of the emptiness [primitiveness] of the fundamental parallelepiped of a crystal lattice, 9121

Belov, N. V. and Belova, E. N. The structure of tourmaline, 3936

Belov, N. V. and Matveeva, R. G. Determination of the parameters of beryl by the method of partial projections, 750

Belova, E. N. *See* Belov, N. V., 3936

Belyaev, I. N. and Mironov, K. E. Electrical conductivity of systems consisting of melted mercury halides and ammonium halides, 2692

Belyaev, I. N., Novosiltsev, N. S., Khodakov, A. L. and Fesenko, E. G. New varieties of monocrystals of barium titanate, 9807

Belyakov, A. P. The complete energy spectrum (scale), 6093

Belzer, J., Gamow, G. and Keller, G. On the stellar dynamics of spherical galaxies, 3292

Bénard, J. *See also* Bardolle, J., 3193; Michel, A., 6334

Bénard, J. and Bardolle, J. On the epitaxial growth of ferrous oxide crystals by controlled oxidation of iron at high temperatures, 8338

Bénard, J. and Moreau, J. Kinetics of the reduction of ferrous oxide by hydrogen, 2119

Bendel, W. L. *See also* Shore, F. L., 8924

Bendel, W. L., Shore, F. J. and Becker, R. A. 24-minute radiations from Ag^{106}, 8922

Bender, H. Electro-optical measurement of angles by a photometric method, 7577
Bender, H. K. Results of more recent measurements of atmospheric interference with radio reception, chiefly on 9 Mc/s, 4930
Béné, G. J., Denis, P. M. and Extermann, R. Evidence for favoured nuclear structures, 539
Béné, G. J., Denis, P. M. and Extermann, R. C. Characteristics of stable nuclei, 1967. Observation of nuclear magnetic resonance with a single sweep, 2915. Measurement of transverse nuclear magnetic relaxation, 6384. Beats of beats, 8897
Benedicks, C. Influence of liquid surface tension upon the wetting effect, 7600. Method for determining the surface tension of solids, 8559. Liquostriction of solids, a consequence of the wetting effect, 8560
Benedict, T. S. and Woodward, W. M. Photodisintegration of He^4, 9707
Benedict, W. S. and Plyler, E. K. Absorption spectra of water vapor and carbon dioxide in the region of 2·7 microns, 5283
Benesch, W. and Strong, J. The optical image transformer, 4235
Benesch, W. M., Elby, F. P. and Elder, J. T. An investigation of the 2 943-cm^{-1} line of the solar spectrum, 3286
Benioff, H. Earthquakes and rock creep, 6607
Benn, R. E. *See* Agnew, J. T., 4240
Benner, A. H. and Nearhoof, H. J. Polarimeter for the study of low frequency radio echoes, 2868
Benner, S. Radiotherapeutic physics. III. A survey of hospital physics activities at the Institute of Radiophysics, Stockholm, 9882
Bennett, A. E. Electromechanical registers as used in radioactive counting systems, 4134
Bennett, A. I. and Hunter, L. P. Pulse measurement of the inverse voltage characteristics of germanium point contacts, 3522
Bennett, F. D. Optimum source size for the Mach-Zehnder interferometer, 2578. Effect of size and spectral purity of source on fringe pattern of the Mach–Zehnder interferometer, 6145. *See also* Geise, J. H., 890
Bennett, G. A. Nomograph for calculating shielding for Co^{60}, 8397
Bennett, G. S. On multiple excitation of an elastic system, 5175. A note on the activation of photographic emulsions by ultrasonic waves, 7633
Bennett, H. E. Electrical resistance of platinum high temperatures, 4377
Bennett, J. A. A study of fatigue in metals by means of X-ray strain measurement, 8271
Bennett, R. R. and Fulton, A. S. The generation and measurement of low frequency random noise, 9458
Bennett, R. S. A portable strain gauge equipment for use on motor cycles, 100
Bennett, W. E., Roys, P. A. and Toppel, B. J. Simple capture of alpha-particles, 4696
Benoist, P., Kowarski, L. and Netter, F. Measurement of thermal neutron absorption by the modulation of a pile, 8206
Benoist-Gueutal, P., Prentki, J. and Ratier, J. On the production of nuclear mesons of spin zero by photons, 1317
Benoit, H. *See* Horn, P., 5332
Benoit, R. Thermomagnetic investigation of boro-ferrites, 1924
Bensley, R. D. Natural colour photography in colloidal silver, 2290
Benson, G. C. and Shuttleworth, R. The surface energy of small nuclei, 4892
Benson, G. C. and Wyllie, G. A quantum mechanical treatment of the lithium fluoride crystal, 3681
Benson, N. C., Hass, G. and Scott, N. W. 72-inch high vacuum evaporator and its glow discharge equipment, 2083
Benson, R. W. *See* Morrical, K. C., 1689
Benson, W. H., Jr. *See* LaGrone, A. H., 5611
Benson, S. W. The significance of the frequency factor in unimolecular reactions, 8289
Bentley, G. P. Industrial tristimulus color matcher, 8665
Benzie, R. J. Spin-lattice relaxation in diluted paramagnetic salts, 7088
Benzie, R. J. and Cooke, A. H. The magnetic susceptibility of copper sulphate, 2838. Thermal and magnetic properties of caesium titanium alum, 9603. The magnetic susceptibility of copper caesium sulphate, 1930
Beranek, L. L. Errata: Acoustic measurements, 4209
Beranek, L. L., Marshall, J. L., Cudworth, A. L. and Peterson, A. P. G. Calculation and measurement of the loudness of sounds, 5219
Berbert, J. H. *See* Nelson, J. R., 9392
Berestetskiĭ, V. B. The spectrum of positronium, 8112. On the inner parity of the positron, 8520
Berestetskiĭ, V. B. and Landau, L. D. Interaction between an electron and a positron, 7561
Berestetskiĭ, V. B. and Pomeranchuk, I. Ya. On the decay of charged π-meson into neutral meson on collison with proton and deuteron, 8988
Berezhnaya, I. N. *See* Brumberg, E. M., 3185
Berg, G. J., van den. *See* van den Berg, G. J.
Berg, O. E. and Stauss, H. E. Use of a photo-tube to correlate contact separation with electrical transients, 4393
Berg, T. G. Owe. *See* Owe Berg, T. G.
Bergdolt, V. E. *See* Geise, J. H., 890
Bergeon, R. *See* Robin, S., 7623
Berger, E. R. The two-dimensional field problem of two conducting planes. I, 8710
Berger, J., Canavaggia, R. and Chalonge, D. The Balmer discontinuity of HD 190 073, 1590
Berger, J., Canavaggia, R., Chalonge, D. and Fringant, A.-M. Spectrophotometric study of some sub-dwarfs, 6706. The Balmer discontinuity for some "extended-atmosphere" stars, 7494
Berger, J. and Fringant, A. M. Spectrophotometric study of three metallic-line stars, 7483
Berger, M. J. *See also* Groetzinger, G., 4451, 5737
Berger, M. J., Lord, J. J. and Schein, M. Multiple Coulomb scattering of high energy [337 MeV] protons in photographic emulsions, 8785
Berghezan, A., Lacombe, P. and Chaudron, G. Microradiographic study of grain boundaries in pure Al and the solid solution Al–Zn during melting, 1351
Bergman, B. G. and Shoemaker, D. P. The space group of the σ–FeCr crystal structure, 5919
Bergman, S. Determination of axially-symmetric flow patterns of a compressible fluid, 3398
Bergmann, L. Powder patterns produced with alternating potentials, 7830
Bergmann, O. A differential equation for the phase in neutron-proton scattering, 86. On the nuclear photoeffect in beryllium, 8197. *See also* Glaser, W., 2731, 7010
Bergmann, P. G. *See also* Anderson, J. L., 8502
Bergmann, P. G., Penfield, R., Schiller, R. and Zatzkis, H. The Hamiltonian of the general theory of relativity with electromagnetic field, 847
Bergner, Yu. K. Theory of the oscillations of interacting electron currents, 9611
Bergstralh, T. A. and Schroeder, C. A. A search for cosmic-ray diurnal effects at balloon altitudes, 3615
Bergström, I. On the isomerism of Xe^{131}, 1276. In the isomerism of Kr^{83} and Xe^{133}, 4651. Neutron-induced isomers of xenon: a new isomer of xenon-129, 6405. On the decay of Xe$^{125} \rightarrow$ I$^{125} \rightarrow$ Te^{125}, 6413. β-Spectrometer investigations on electromagnetically separated Xe^{135} and Kr^{79}, 6424
Bergström, I. and Thulin, S. On the isomerism of Kr^{85}, 580. On the decay of Xe^{133m}, 581
Bergtold, F. The arrangement of sound sources in rooms and auditoria, 5221
Beringer, R. *See also* Castle, J. G., Jr, 1182
Beringer, R. and Castle, J. G., Jr. Microwave magnetic resonance spectrum of oxygen, 2534
Berkeley, E. C. The relations between symbolic logic and large scale calculating machines, 785
Berker, R. On certain properties of the force exerted on a surface in contact with a viscous fluid, 2420
Berkner, L. V. Continuous recording of dominant ionospheric characteristics, 6627
Berkovich, E. S. *See* Krushchev, M. M., 3805
Berlin, T. Binding regions in diatomic molecules, 4584

Berlin, T. H. Neutron-capture theory of element formation in an expanding universe. Appendix, 9682. *See also* Greenberg, J. M., 5473; Montroll, E. W., 9589

Berlman, I. B. Grain counts and corrected α-particle range-energy curve for Ilford E–1 emulsions, 2284. On the bombardment of Li_2O and C by alpha-particles and deuterons, 2994

Berman, D. A., Saunders, P. R. and Winzler, R. J. Vibrating dropping mercury electrode for polarographic analysis of agitated solutions, 9114

Berman, M. *See* Loevinger, R., 9649

Berman, R. The thermal conductivity of some alloys at low temperatures, 6920. The thermal conductivities of some dielectric solids at low temperatures (experimental), 7802

Berman, R., Klemens, P. G., Simon, F. E. and Fry, T. M. Effect of neutron irradiation on the thermal conductivity of a quartz crystal at low temperature, 1793

Berman, R., Simon, F. E. and Wilks, J. Thermal conductivity of dielectric crystals: the "Umklapp" process, 9416

Bernard, M. The axial potential in gridded lenses, 8769

Bernard, R. *See also* Rolland, M. T., 5614

Bernard, R. and Davoine, F. Detector for very weak magnetic fields and its applications in electron microscopy, 1172

Bernard, R., Davoine, F. and Hirtz, J. Research on thin adsorbed layers by means of radioactive tracer elements, 7354

Bernard, R., Pernoux, E. and Teichner, S. Determination of specific surfaces by means of the electron microscope, 7311

Bernardini, G., Booth, E. T. and Lederman, L. On the nuclear interaction of π^- mesons in nuclear emulsions, 5738. Nuclear absorption of negative pi-mesons at different energies, 9725

Bernardini, G., Booth, E. T., Lederman, L. and Tinlot, J. Nuclear interaction of π-mesons, 3048

Bernardini, G., Booth, E. T. and Lindenbaum, S. J. Stars induced by 350- to 400-Mev protons, 2998. On the Goldberger model for the interaction of high energy nucleons with heavy nuclei, 8181

Bernardini, G., Cortini, G. and Manfredini, A. On nuclear evaporation in cosmic rays and the absorption of the nucleonic component. II, 469. On nuclear evaporation in cosmic rays, 470

Bernardo, A. di. *See* di Bernardo, A.

Bernasconi, A. and Caldirola, P. On the relativity and spin corrections for a particle in a central field, 4100

Bernasconi, C. Photoelectric instrument for calculating correlation coefficients and for other computations, 784. On the periodic analysis of curves, 787

Bernaudat, J. *See* Bonne, R., 6265

Berne, E. The calculation of the geometrical efficiency of end-window Geiger–Müller tubes, 7966

Bernhart, J. Relation between architectural acoustics and microphonic acoustics, 1707

Bernstein, H. J. The structure of nitrosyl chloride from the microwave absorption spectrum, 2533. An aid in making vibrational assignments, 4581. The calculation of the change in vibrational frequency due to changes in mass, geometry, and potential constants of a molecule, 4586. The central force model for additive molecular properties, 4876. *See also* Burns, W. G., 2541

Bernstein, H. J. and Powling, J. Erratum: The vibrational spectra and structure of inorganic molecules. II. Sulfur S_8, sulfur chloride S_2Cl_2, phosphorus P_4, 4260

Bernstein, I. B. Improved calculations on cascade shower theory, 2793

Bernstein, R. B. *See also* Dibeler, V. H., 4486; Kniebes, D. V., 7023

Bernstein, R. B. and Cubicciotti, D. The permeability of zirconium to hydrogen, 7302

Bernstein, S. *See* Clapp, C. W., 2403

Berroth, A. The gravitational declination, its determination and elimination, 8485

Berry, C. R. Growth of silver filaments and dendrites, 2276. Lattice defects in silver bromide, 5921

Bersano, C. A general method of quantitive spectrographic analysis, 9119

Bertaut, E. F. Structures of boroferrites, 1510. Recen investigations of the crystallography of ferrites, 6351

Bertaut, F. Relations between the structure and the symmetrized Patterson function, 3207

Bertaut, F. and Blum, P. Structure of the disilicide of cobalt, 754

Bertaux, G. *See* Lejay, P., 8066

Bertein, F. Transverse convergence created by the slits of ion optical instruments, 1114. On the suppression of the exit slit in an ion source, 2757 On the aberrations of ion lenses in ion sources, 3579 On the experimental determination of fields by Marton's electronic method, 4429. On the genera properties of weak electron lenses: the first approximation, 7935. Ionic optics, ion focusing in the mass spectrometer, 7948. Construction of gaseous and electric spectrometer circuits, 7949. The application of mass spectrometry to radioactivity and chemistry, 7950

Berthelot, A. *See also* Faraggi, H., 8158

Berthelot, A., Papineau, L. and Herczeg, C. On the non-existence of isomerism in Br^{82}, 3738

Berthier, G. *See* Mayot, M., 8875

Berthier, J. *See* Thibaud, J., 921

Berthier, P., Courty, C. and Gauthier, J. Paramagnetism of copper sulphate solutions, 9598

Berti, L. Contributions to the theory of phase contras microscopy, 4320

Bertin, J. Modified Hilsch apparatus for producing hot and cold air streams, 8700

Berton, A. Relationships between melting temperatures and boiling temperatures of elements, 9419

Bertrand, M. and Rinfret, M. The theory of open-tube distillation column, 2609

Berz, F. Reflection and refraction of microwaves at a set of parallel metallic plates, 1950

Beser, J. *See* Talbot, S. A., 4200

Beskow, G. and Treffenberg, L. On the so-called prestellar state of matter and the abundance distribution of chemical elements. I–II, 5011

Besse, M. *See* Trillat, J.-J., 4323

Best, A. C. The size of cloud droplets in layer-type cloud, 9212. Drop-size distribution in cloud and fog, 9213

Betcherman, I. I. Rate processes in physical metallurgy 7439

Beth, R. A. and Wells, C. P. Finite deflections of a cantilever-strut, 6045

Bethe, H. A. *See also* Beard, D. B., 8524; Gluckstern R. L., 4765; Hurwitz, H., Jr, 5782; Walske, M. C. 8140

Bethe, H. A., Tonks, L. and Hurwitz, H., Jr. Neutron penetration and slowing down at intermediate distances through medium and heavy nuclei, 1327

Bethe, H. A. and Wilson, R. R. Meson scattering, 8229

Beun, J. A. *See* Steenland, M. J., 5586

Beutelspacher, H. *See* Flaig, W., 3807

Bevan, C. W. L. and Craig, D. P. The intensity of the A_{1g}-E_{1u} transition in benzene, 8874

Bevan, D. J. M. and Anderson, J. S. Electronic conductivity and surface equilibria of zinc oxide, 1056

Bever, R. S. and Sproull, R. L. The dielectric constan of barium oxide, 7837

Bevington, J. C. and Norrish, R. G. W. The catalyzed polymerization of gaseous formaldehyde, 3883

Beyer, R. T. The contribution of thermal conductivity to the ultrasonic absorption coefficient in liquefied gases, 6085. *See also* Smith, M. C., 4189 Tamarkin, P., 4194

Beyerle, K., Groth, W., Harteck, P. and Jensen, H On gas-centrifuges. Enrichment of the Xe, Kr Se-isotopes by the centrifuge method, 5678

Beyersdorfer, K. On the structure of graphite oxide soot, 6497

Beyersdorfer, K. and Mölbert, E. The preparation of tissue sections for examination in the electron microscope, 9022

Beynon, W. J. G. and Brown, G. M. Geophysical and meteorological changes in the period January–April 1949, 9204

Beyster, J. R. and Wiedenbeck, M. L. Beta-gamma angular correlation experiments, 589

Beznosikova, A. V. and Iveronova, V. I. Atomic diffraction of X-rays in copper-zinc alloys, 3210

Bezuglyi, P. A. *See* Galkin, A. A., 9487–8

Bhabha, H. J. Note on the complete stochastic treatment of electron cascades, 1158

Bhabha, H. J. and Ramakrishnan, A. The mean square deviation of the number of electrons and quanta in the cascade theory, 1154

Bhagavantam, S. and Puranik, P. G. Fluorescence of crystalline magnesium oxide, 210

Bhagavantam, S. and Ramavataram, K. Velocity of sound in metals, 903

Bhagavantam, S. and Seshagiri Rao, T. Elastic constants of galena, 8259

Bhatnagar, A. S. Thermal ionization of calcium and determination of specific charge of Ca^+, 7982. Thermal ionization of aluminium and determination of the specific charge of Al^+, 7984. *See also* Srivastava, B. N., 7983

Bhattacharya, D. L. The method of shadow-casting in photomicrography, 9411

Bhide, V. G. Production of Joshi effect in iodine vapour under X-rays, 9509

Bhimasenachar, J. Elastic constants of corundum, 1479

Bhimasenachar, J. and Seshagiri Rao, T. Elastic constants of some cubic nitrates, 1478

Biberman, L. and Panin, B. Measurement of the parameters of an electrodeless h.f. discharge by two probes, 6245

Biberman, L. M. and Gurevich, I. M. Absorption of resonance radiation and formation of metastable atoms in mercury vapours, 1733

Biberman, L. M., Vtorov, E. N., Kovner, I. A., Sushkin, N. G. and Yavorskiĭ, B. M. The scattering of electrons in thin films, 371

Bibl, K. Methods of determining the ionization variation above the maximum in the *E*-layer, 1537. The ray path in a curved ionospheric layer, 3668

Bichsel, H. *See also* Stebler, A., 619

Bichsel, H., Hälg, W., Huber, P. and Stebler, A. The cross section ratio $\sigma[B^{10}(n, \alpha)Li^7]/\sigma[B^{10}(n, \alpha) Li^{7*}]$ as a function of energy, 4733

Biedenharn, L. C. A note on time reversal and the Dirac equation, 5110. *See also* Arfken, G. B., 9677; Blatt, J. M., 6737

Biedenharn, L. C., Arfken, G. B. and Rose, M. E. Angular correlation in the triple cascade transitions, 8156. Polarization of gamma radiation following capture of polarized neutrons, 8948

Biedenharn, L. C. and Rose, M. E. The relative phase of the interaction constants for mixed invariants in beta-decay, 8172

Biegelmeier, G. Contribution to the classical diffusion theory, 3390, 9324

Biehl, A. T. and Neher, H. V. Cosmic rays at airplane altitudes, 8811

Bielak, E. B., Mardles, E. W. J. and Tingle, E. D. The spreading behaviour and lubricating properties of mixed liquids, 3849

Bielanski, A. and Tompkins, F. C. Sorption of water by dehydrated alum crystals, 3871

Bierlein, T. K. and Lingafelter, E. C. The crystal structure of acetoxime, 9174

Bierman, H. R. and Jenkins, R. A hypodermic pressure manometer utilizing the bonded wire resistance strain gauge, 4133

Biermann, L. Remarks on the law of rotation in terrestrial and stellar zones of instability, 6718

Biermann, L., Haxel, O. and Schlüter, A. Neutral cosmic radiation from the sun, 5029

Biermann, L. and Schlüter, A. Cosmic radiation and cosmic magnetic fields. II. Origin of cosmic magnetic fields, 6680

Bigay, J. Photometry of the galaxies by the Fabry method, 3268. Remarks on the mean absolute magnitude and the radial-velocity/apparent-magnitude relation for extra-galactic nebulae, 4058. Photometry of extra-galactic nebulae by the Schilt method, 5009

Bigeleisen, J. *See also* Bothner-By, A. A., 7342; Friedman, L., 1396

Bigeleisen, J. and Allen, T. L. Fractionation of the carbon isotopes in decarboxylation reactions. IV. The relative rates of decomposition of 1-C^{12} and 1-C^{13} trichloracetate ions, 7343

Bigeleisen, J. and Friedman, L. The infra-red spectra of $N^{15}N^{14}O^{16}$ and $N^{14}N^{15}O^{16}$. Some thermo-dynamic properties of the isotopic N_2O molecules, 2540

Bigg, P. H. and Burch, F. H. The stability of analytical weights, particularly in chemical laboratories, 6052

Biguenet, C. Photo-adsorption by a thin film of barium, 1119

Bijlaard, P. P. Foundations of the mathematical theory of plasticity—and experiment, 5829

Bijvoet, J. M. *See* Bokhoven, C., 6598; Peerdeman, A. F., 9160

Bijvoet, J. M., Peerdeman, A. F. and van Bommel, A. J. Determination of the absolute configuration of optically active compounds by means of X-rays, 9161

Bikerman, J. J. Sliding of drops from surfaces of different roughnesses, 876

Bilby, B. A. *See* Cottrell, A. H., 7376

Bildé, H. Methods of interpreting electron diffraction diagrams, 2744

Bilimovitch, A. On the seasonal variation of the rotation of the earth, 1591

Billig, E. Thermal instability of contact rectifiers: The effect of the constituent materials on the efficiency of a rectifying junction, 5409. Application of the image-force model to the theory of contact rectification and of rectifier breakdown, 6216. Effect on temperature on the height of potential barriers and on the breakdown voltage of contact rectifiers, 9473

Billig, E. and Plessner, K. W. A note on the dielectric dispersion in polycrystalline materials, 6204

Billig, E. and Ridout, M. S. Height of the potential barrier in contact rectifiers and its change with temperature, 7892

Billington, C. and Davies, D. A. The principle and adjustment of the Hilger–Müller double monochromator, 5265

Bilton, N. F. *See* Ward, A. F. H., 1640, 3843

Biltz, M. Spectral sensitivity and chemical sensitization of photographic emulsions, 9893

Binder, R. C. *See* Fleming, F. W., 7619

Binge, H.-J. Some remarks on Weizsäcker's theory of the development of giants, 5048

Bingel, W. *See* Hückel, E., 5638

Binnie, A. M. The theory of waves travelling on the core in a swirling liquid, 3368. The effect of friction on surges in long pipe-lines, 9304

Binnie, W. P. The crystal structure of lanarkite $PbO.PbSO_4$, 9158

Binnie, W. P. and Robertson, J. M. The crysta structure of hexamethylenediamine, 1515

Biondi, M. A. Ambipolar diffusion in neon, 350. Microwave gas discharges, 1074. Ionization by the collision of pairs of metastable atoms, 5504. Preparation of extremely pure helium gas, 7818. Measurement of the electron density in ionized gases by microwave techniques, 7913. Ionization of argon atoms by helium or neon metastable atoms, 7980

Biondi, M. A. and Holstein, T. Concerning the mechanism of electron-ion recombination, 7981

Birch, F. Recent work on the radioactivity of potassium and some related geophysical problems, 9190

Birchard, J. R. *See* Trotman-Dickenson, A. F., 4845

Bird, G. R. *See* Blout, E. R., 7667

Bird, R. B. *See also* van Kranendonk, J., 7174

Bird, R. B., Spotz, E. L. and Hirschfelder, J. O. The third virial coefficient for non-polar gases, 899

Birebent, R. Modification of the current-voltage characteristics of a gaseous photocell with a plane cathode in a magnetic field perpendicular to the cathode, 5416

Birge, R. W. Proton-proton scattering at 100 Mev, 1876

Birge, R. W., Kruse, U. E. and Ramsey, N. F. Proton-proton scattering at 105 Mev and 75 Mev, 7026

Birger, N. *See* Azimov, S., 9568

Birkhoff, G. Hydrodynamics, 3361

Birkhoff, G. and Burton, L. Note on Newtonian force-fields, 4121

Birkhoff, R. D. Distribution of energy loss of electrons in aluminum, 5466

Birks, E. W. *See* Jones, D. C., 5878

Birks, J. B. Scintillation efficiency of anthracene crystals, 985. Nuclear scintillation counters, 7970

Birks, J. B. and Black, F. A. Deterioration of anthracene under α-particle irradiation, 6140

Birnbaum, G. Fluctuations in the refractive index of the atmosphere at microwave frequencies, 7425

Birnbaum, G., Kryder, S. J. and Lyons, H. Microwave measurements of the dielectric properties of gases, 2664
Birnbaum, M. *See* Shapiro, M. M., 8014
Birtley, W. B. *See* Brown, W. N., Jr, 4982
Bishop, A. S. *See also* Aeppli, H., 6445
Bishop, A. S., Steinberger, J. and Cook, L. J. Production of positive mesons by photons on hydrogen, 2060
Bishop, A. W. Laboratory measurement of earth pressure, 100
Bishop, F. W. Photometer for electron microscope, 927
Bishop, G. R. *See* Beghian, L. E., 7244
Bishop, J. F. W. and Hill, R. A theory of the plastic distortion of a polycrystalline aggregate under combined stresses, 5831
Bishop, G. R. *See also* Wilson, R., 388
Bishop, G. R., Beghian, L. E. and Halban, H. The angular distribution in the photodisintegration of the deuteron at low energies, 9704
Bishop, G. R., Collie, C. H., Halban, H., Hedgran, A., Siegbahn, K., du Toit, S. and Wilson, R. The cross section for photo-disintegration of the deuteron at low energies, 1307; Erratum, 4723
Bishop, G. R., Halban, H., Shaw, P. F. D. and Wilson, R. The angular distribution of the neutrons produced in the photo-disintegration of the deuteron by the 2·51-Mev gamma-rays of Ga^{72}, 3773
Bishop, M. E. *See* Liebson, S. H., 3450
Bishui, B. M. On the origin of fluorescence in diamond, 3456*
Biswas, S. *See* Hopper, V. D., 3793
Bitter, F. and Reed, F. E. A new type of electromagnet. I. Operation at 20-kW level, 4519
Bizette, H. Experimental evidence in the problems of antiferromagnetism, 6331
Bizzell, O. M. *See also* Tompkins, P. C., 2149*
Bizzell, O. M., Burnett, W. T., Jr, Tompkins, P. C. and Wish, L. Properties of phosphorus-Bakelite beta-ray sources, 7225
Bjerhammar, A. Application of calculus of matrices to method of least squares with special reference to geodetic calculations, 7499
Bjerknes, V. Dynamics and electromagnetism, 3647
Bjorklund, F. E. *See* Hodgdon, F. B., 683
Björklund, O. *See* Aler, B., 2767
Blachman, N. M. Synchrotron-oscillation resonance, 2756. Forced betatron oscillation in a synchrotron with straight sections, 8780
Black, F. A. *See* Birks, J. B., 6140
Black, M. H. *See* Hubbard, D., 3142
Blackburn, P. E. *See* Johnston, H. L., 3487
Blackett, P. M. S. Cloud chamber studies of penetrating showers, 422
Blackman, M. On θ values in the resistance of metals, 7902. Diffraction from a bent crystal, 8366. Diffraction from a curved linear lattice, 8367. *See also* Smollett, M., 8340
Bladel, J. van. *See* van Bladel, J.
Bladergroen, W. A unit of wave-number, 7500
Blaha, F. Use of a magnetic field in detecting corrosion currents, 702. Rochelle salt preparation, high-pressure-moulded for crystal plates, 3900
Blaha, F. and Schedling, J. A. Improvements in visual depiction of magnetic lines of force by means of a gas discharge, 2825
Blaha, Frd. *See* Blaha, Frz., 3238
Blaha, Frz. and Blaha, Frd. The light reflected by an object in fog, 3238
Blair, G. W. Scott. *See* Scott Blair, G. W.
Blair, K. W. *See* Burson, S. B., 7219
Blake, G. G. Rectified radio-frequency applications, 1464. Distortion of rectified radio-frequency graphs, 1467. Conductimetric analysis at radio-frequency, 3888
Blamont, J. E. and Kastler, A. Construction of a photoelectric photometer for sodium *D* line twilight emission study in the upper atmosphere, 8384
Blanchard, C. H. and Avery, R. Velocity dependent interactions and nuclear shells, 2917
Blanchard, D. C. The behavior of water drops at terminal velocity in air, 3382
Blanc-Lapierre, A. Some statistical models useful in the study of noise, 791. Notes on conditional stationary Laplace functions, 4994. On the harmonic analysis at stationary Laplacian random functions, 4995
Blanc-Lapierre, A. and Perrot, M. Diffraction and the quantity of information, 233. Experiments at normal temperatures on the electrical conductivity of very thin silver films under intense electric fields, 1047
Blanc-Lapierre, A., Perrot, M. and Dumontet, P. Experimental study of a linear filter by an optical method, 4317. The correction of defects due to diffraction, 5321
Blanc-Lapierre, A., Perrot, M. and Nifontoff, N. On the conductivity of thin carbon films, 8733. The effect of fluctuations in thin carbon films, 8734
Bland, M. E. M. *See* Jeffreys, H., 9839
Blandin, J. Orientation of crystal nuclei of hydrated magnesium sulphate in an electric field, 2156
Blank, A. *See* Keller, J. B., 9400
Blankenfeld, G. Secondary emission from Ni, Mo, MgO and glass, 7018
Blanuša, D. The fundamentals of relativistic kinematics, 9261
Blaser, J. P., Boehm, F. and Marmier, P. The decay of Sb^{120}, 2939. Excitation functions of the reaction (*p*, *n*). I, 3763
Blaser, J. P., Boehm, F., Marmier, P. and Wäffler, H. On the isomerism of Sb-120, 9665
Blatt, J. M. and Biedenharn, L. C. The angular dependence of scattering and reaction cross sections, 6737
Blau, M., Rudin, R. and Lindenbaum, S. A semi-automatic device for analyzing events in nuclear emulsions, 3759
Bleaney, B. Paramagnetic resonance spectra of five chromic sulphate alums at low temperatures, 1932. Thermal properties of potassium chromic alum between 0·05 and 1°k, 1933. Spectroscopy at centimetre wavelengths, 2532. Spectroscopy at radiofrequencies (Conf. rep.), 3428. Note on the adiabatic demagnetization of cobalt ammonium sulphate, 5571. Hyperfine structure in paramagnetic salts and nuclear alignment, 5572. On the spacial alignment of nuclei, 5671 Hyperfine structure in paramagnetic resonance, 7101
Bleaney, B., Bowers, K. D. and Ingram, D. J. E. Quadrupole movements of copper 63 and 65, 9605
Bleaney, B. and Ingram, D. J. E. The paramagnetic resonance spectra of two salts of manganese, 3638. Paramagnetic resonance and hyperfine structure in four cobalt salts, 8037
Bleaney, B., Ingram, D. J. E. and Scovil, H. E. D. Paramagnetic resonance in vanadous ammonium sulphate, 8036
Bleaney, B. and Scovil, H. E. D. Nuclear spins of neodymium 143 and 145, 1981. Nuclear spin of erbium-167, 4533
Blears, J. and Leck, H. J. Differential methods of leak detection, 7612
Bleil, C. E. *See* Howard, R. A., 3962
Bleil, D. F. *See* Trounson, E. P., 490
Bleksley, A. E. H. A new approach to cosmology. III, 8442
Bless, A. A. Bioelectric potentials as a measure of radiation injury, 2237
Bleuler, K. A new method for the treatment of longitudinal and scalar photons, 69
Bleuler, K. and Heitler, W. The reversal of time and the quantization of the longitudinal field in quantum electrodynamics, 5077
Blinova, N. M. *See* Eĭdus, L. Kh., 2786
Blin-Stoyle, R. J. Polarized nuclear reactions, 8180
Blin-Stoyle, R. J. and Spiers, J. A. On the theory of beta-decay, 7234
Blitzer, L. and Cady, W. M. Excitation temperature in time-resolved spectra of single condensed spark discharges, 6836
Blizard, R. B. Visco-elasticity of rubber, 6506
Bloch, C. Variation principle and conservation equations in non-local field theory, 834. On some developments in non-local field theory, 5070
Bloch, F. Nuclear induction, 7181. Magnetic moments of even-odd nuclei, 8900. Nuclear relaxation in gases by surface catalysis, 9640

Bloch, F. and Jefferies, C. D. A direct determination of the magnetic moment of the proton in nuclear magnetics, 1982

Bloch, I., Hull, M. H., Jr, Broyles, A. A., Bouricius, W. G., Freeman, B. E. and Breit, G. Methods of calculation of radial wave functions and new tables of Coulomb functions, 2391. Coulomb functions for reactions of protons and alpha-particles with the lighter nuclei, 9687

Block, M. M. *See also* Passman, S., 7293

Block, M. M., Passman, S. and Havens, W. W., Jr. Cross section for production of charged π-mesons in C and H at 90° to a 381-MeV proton beam, 7292

Block, S. A survey-meter for soft betas in air, 7968

Blocker, H. G. *See* Dallavalle, J. M., 9079

Blocker, W. *See* McMillan, E. M., 4630

Blodgett, K. B. Surface conductivity of lead silicate glass after hydrogen treatment, 3528

Bloembergen, N. *See also* Kohn, W., 2524, 4256

Bloembergen, N. and Poulis, N. J. On the nuclear magnetic resonance in an antiferromagnetic crystal, 3640

Bloembergen, N. and van Heerden, P. J. The range and straggling of protons between 35 and 120 MeV, 7955

Blokhintsev, D. I. *See* Kolesnikov, N. N., 9529

Blom, E. C. A new method of measuring pressure electrically, 1636

Bloom, A. L. *See* Stern, M. O., 7025

Bloom, M. *See* Brockhouse, B. N., 8983

Bloom, M. C. *See* von Hippel, A., 694

Blottiau, F. The concept of a perfect optical instrument, 1004. Experimental test of the principle of colorimetry, 4315. *See also* Tessier, M., 9870

Blout, E. R. and Bird, G. R. Infrared microspectroscopy. II, 7667

Blüh, O. and Terentiuk, F. The electric conductivity of weak electrolytes and ampholytes at high electric field strengths, 3136

Blum, A. I. and Goryunova, N. A. Electrical properties of grey tin, 3525

Blum, A. I. and Regel, A. R. Electric properties of solid solutions of mercury-selenide and selenium, 9468

Blum, E.-J. and Denisse, J.-F. Comparison of solar radio-wave radiations on two neighbouring frequencies, 2330

Blum, E.-J., Denisse, J.-F. and Steinberg, J.-L. A study of solar radio disturbances of feeble intensity, 3281. On the interpretation of bursts of solar radio radiation, 4047

Blum, P. *See* Bertaut, F., 754

Blunck, O. and Leisegang, S. On the energy loss of fast electrons in thin layers, 2728

Blundell, M. and Rotblat, J. On the existence of a one-MeV energy level in C^{13}, 3699. Use of liquid nuclear research emulsion in track autoradiography, 6671

Boadway, J. D. A condenser aperture device for electron microscopes, 2735

Boag, J. W. Ionization measurements at very high intensities. I. Pulsed radiation beams, 404

Boag, J. W., Pilling, F. D. and Wilson, T. Ionization chambers for electron dosimetry, 7031

Boas, W. and Mackenzie, J. K. Anisotropy in metals, 7439

Bobrov, M. S. Tentative assessment of the dimensions of the particles and mass of the Saturn rings, 7462

Bochirol, L. True specific heat of zinc, nickel and cobalt ferrites, 6182. *See also* Pauthenet, R., 6340; Weil, L., 7314

Bock, A. de. *See* de Bock, A.

Bock, H. On the heat conduction of gas mixtures, 5351

Bockelman, C. K. Total cross sections of Be, B, O, and F for fast neutrons, 3034. *See also* Coon, J. H., 3037; Johnson, C. H., 6465; Peterson, R. E., 628

Bockelman, C. K., Miller, D. W., Adair, R. K. and Barschall, H. H. Total cross sections of light nuclei for p, γ-neutrons, 9710

Bockris, J. O'M. *See also* Conway, B. E., 9067

Bockris, J. O'M. and Bowler-Reed, J. The measurement of dielectric constants of conducting liquids, 6195

Bockris, J. O'M., Kitchener, J. A. and Davies, A. E. Ionic transport in liquid silicates, 4839

Bodansky, D. Neutron energy distribution in proton bombardment of beryllium, 2034

Bodansky, D. and Ramsey, N. F. Neutron energy distributions in proton bombardment of Be and C at 100 MeV, 7258

Bodea, E. I. A four-dimensional atomistic measure system leading to a natural classification of basic physical constants, 9256

Bodiou, G. Researches on the foundations of the quantum calculus of probabilities in the pure case (Hilbert space, wave principle), 833. Geometric demonstration of the tensor equations of the photon: the complexity of the particle of spin, 845

Boehm, F. *See* Blaser, J.-P., 2939, 3763, 9665

Boelhouwer, J. W. M., Nederbragt, G. W. and Verberg, G. Viscosity data of organic liquids, 1638

Boenning, C. B., Huber, S. F. and Mariner, T. A modification of the box method of determining relative sound absorption coefficients, 4191

Boer, J. de. *See* de Boer, J.

Böer, W. The noise-spectrum cut-off of oscillating circuits, 1825

Boerboom, A. J. H. *See* Lunbeck, R. J., 4172

Boerdijk, A. H. Vector representations of differential equations, their solutions and the derivatives thereof, 5972

Boerner, H. *See* Hönl, H., 90

Boettcher, A. The optical reflection coefficients of evaporated Al–Ag and Al–Mg alloys, 225

Bogaardt, M. and Koudijs, B. Average excitation potentials of air and aluminium, 8805

Bogaardt, M. and Vigneron, L. A calculation between 0·1 MeV and 8 MeV, of the range-energy relation for protons, as a function of the chemical composition of a photographic emulsion. A corresponding calculation for deuterons, tritons, and α-particles. A comparison with the experimental values in the case of the Ilford C_2 emulsion, 3581

Bogan, S., Meites, L., Peters, E. and Sturtevant, J. M. Millicoulometry. I. Construction and operation of an apparatus for the determination of polarographic n-values, 5895

Bogatyrev, O. M. Graph-analytical method of solving algebraic equations of high degrees, 7

Bogdanoff, J. L. On the theory of dislocations, 1364

Bogert, B. P. Determination of the effects of dissipation in the cochlear partition by means of a network representing the basilar membrane, 5952

Bogolyubov, N. N., Bonch-Bruevich, V. L. and Medvedev, B. V. On the invariant construction of a quantum field theory, 2366

Bogoroditskiĭ, N. P. and Fridberg, I. D. Electrical ceramics and characteristics of ionic crystals, 7842

Bohm, D. *See also* Ford, K. W., 1232

Bohm, D. and Gross, E. P. Effects of plasma boundaries in plasma oscillations, 352

Bohm, D. and Pines, D. Screening of electronic interactions in a metal, 2652. A collective description of electron interactions. I. Magnetic interactions, 5379

Bohr, A. On the quantization of angular momenta in heavy nuclei, 2925. Nuclear magnetic moments and atomic hyperfine structure, 4611

Bois, C. On the application of an electromagnetic device for the measurement of the characteristics of the surging sea, 2419

Boisard, J. *See* Pujolle, J., 917

Bokhoven, C., Schoone, J. C. and Bijvoet, J. M. The Fourier synthesis of the crystal structure of strychnine sulphate pentahydrate, 6598

Bol, K. A determination of the speed of light by the resonant cavity method, 1710

Bolam, T. R. *See* Scott, R., 3137; Wilson, J. H., 4859

Bolduan, O. E. A. *See* Bear, R. S., 3077

Boley, F. I. *See* Pratt, W. W., 4440

Bolland, J. L. *See* Bateman, L., 9057

Bolshanina, M. A. Hardening and relaxation as basic phenomena of plastic deformation, 2095

Bolt, R. H. *See* Ballantine, H. T., Jr, 2266; Hueter, T. F., 5208; Ingård, U., 8596–7

Boltaks, B. I. Dependence of the coefficient of the thermo-e.m.f. in semiconductors on the temperature difference of the junctions (on Henisch's, Schweikert's and Rode's papers), 6231

Bolton, J. G. and Westfold, K. C. Galactic radiation at radio frequencies. I. 100 Mc/s survey, 796; III. Galactic structure, 798

Bommel, A. J. van. *See* van Bommel, A. J.

Bonch-Bruevich, A. M. *See* Arkhangelskaya, V. A., 6220

Bonch-Bruevich, V. L. *See also* Bogolyubov, N. N. 2366; Volkenshteĭn, F. F., 6957

Bonch-Bruevich, V. L. and Tyablikov, S. V. On the theory of elementary excitations in a weak non-ideal electron-gas in crystals, 6210

Bond, W. L., Mason, W. P. and McSkimin, H. J. Elastic and electromechanical coupling coefficients of single-crystal barium titanate, 6956

Bondelid, R. O. *See* Karr, H. J., 2759

Bondi, A. On the thermal conductivity of liquids and polymers and its relation to the pressure coefficient of viscosity, 4327

Bondi, C. M. Models for red giant stars. I. General discussion and application to homogeneous models, 3296

Bondi, C. M. and Bondi, H. Models for red giant stars. II. Models with a chemical inhomogeneity and opacity due to photoelectric effect, 3297

Bondi, H. On the interpretation of the Hertzsprung–Russell diagram, 9248. *See also* Bondi, C. M., 3297

Bondi, H. and Gold, T. On the generation of magnetism by fluid motion, 9842

Bonét-Maury, P. Chemical phenomena in water submitted to ionizing radiations, 8306. Radiation chemistry. III. Hydrogen peroxide formation in water exposed to ionizing radiations, 9775

Bonét-Maury, P. and Deysine, A. Effect of the radiation of an atomic pile on water and on solutions of boron, 5872

Bonét-Maury, P. and Lefort, M. Radiochemical equilibria in irradiated water, 2134

Bonetti, A. and Occhialini, G. P. S. Cylindrical emulsions, 9902

Bonetti, A. and Tomasini, G. Absorption of slow μ-mesons in nuclear emulsions, 9723

Bonfiglioli, G. Properties of plane inhomogeneous electromagnetic waves, 2851

Bonfigioli, G. and Montalenti, G. On linear expansion coefficient and melting point of metals, 7808

Bonifas, H. Determination of the saturation point of a diode on an experimental curve log $J = f(\sqrt{F})$, 7988

Bonne, R., Margoloff, R. and Bernaudat, J. A mass spectrometer, 6265

Bonnemay, M. Calculation of the entropy variation relative to the transformation $Zn \rightarrow Zn^{++} + 2\theta$, 8298

Bonnemay, M. and Fairbank, J. Temperature coefficient of the amalgamated copper electrode at constant activity, 3860

Bonner, F. *See also* Turkevich, J., 1405

Bonner, F. and Turkevich, J. Study of the carbon dioxide-carbon reaction using C^{14} as a tracer, 5854

Bonner, F. and Weinstein, A. A Geiger-counter mounting for continuous counting of gas-phase radioactivity, 2765

Bonner, N. A. and Kahn, M. Some aspects of the behaviour of carrier-free tracers. I, 8954; II, 8955

Bonner, T. W. and Butler, J. W. Neutron thresholds from the reactions $T^3(p, n)He^3$, $Li^7(p, n)Be^7$, $Be^9(d, n)^*B^{10}$ and $O^{16}(d, n)F^{17}$, 8959

Bonvallet, G. L. Levels and spectra of traffic, industrial, and residential area noise, 6819

Booker, D. V. *See* Cavanagh, P. E., 2985

Booker, H. G. and Gordon, W. E. Outline of a theory of radio scattering in the troposphere, 1547

Boomgaard, J. van den. *See* van den Boomgaard, J.

Boonstra. B. B. S. T. Stress-strain properties of natural rubber under biaxial strain, 666

Boorse, H. A. *See also* Cook, D. B., 1065, 1849; Dash, J. G., 2620, 6931

Boorse, H. A. and Dash, J. G. A new method for measuring film transport in liquid He II, 261. Transport rates of the liquid He II films over various surfaces, 1015

Booth, A. D. Design principles of all purpose digital computers, 8

Booth, A. H. Anomalous co-crystallization of radioactive trace quantities of foreign ions with sodium chloride crystals. I. Correlation with crystallographic effects, 9126; II. An examination of the criteria distinguishing anomalous mixed crystals from internal adsorption compounds, 9127

Booth, C. F. *See* Vigoureux, P., 2459

Booth, E. T. *See* Bernardini, G., 2998, 3048, 5738, 8181, 9725; Lederman, L., 3790, 8991

Booth, F. The cataphoresis of spherical, solid nonconducting particles in a symmetrical electrolyte, 332. The electroviscous effect for suspensions of solid spherical particles, 333. The cataphoresis of spherical particles in strong fields, 1067. The dielectric constant of water and the saturation effect, 4366. The solution of some potential problems in the theory of electrolytes, 7348

Bopp, F. *See also* Sommerfeld, A., 1920, 4078

Bopp, F. and Haag, R. On the possibility of spin models, 4110

Borchert, R. The effective ionization potential in high pressure discharges, 355. The origin of the continuum in the high pressure mercury discharge and the value of its mean excitation voltage, 356

Borel, E. The use of line co-ordinates for the study of radiation, 5224

Borel, J.-P. Temperature variation of the electrica properties of thin films containing gaps, 8726

Borg, S. F. On an application on dimensional analysis 4028

Borgardt, A. Anticommutating matrices in meson theory, 9271

Borgardt, A. A. Theory of polarization of dipolar liquids and gases in a constant electric field. II. Orientation polarization of compressed dipolar gases and of solutions of dipolar substances in apolar solvents, 6944

Borgardt, A. A. and Finkelshteĭn, B. N. Theory of polarization of dipolar liquids and gases in a constant electric field. I, 6193

Borkowski, C. J. *See* Brosi, A. R., 4645

Born, K. F. and Hückel, E. The non-relativistic second approximation of Born collision theory for the Yukawa potential, 9277

Born, M. and Yang, L. M. Nuclear shell structure and nuclear density, 543

Borodovskaya, L. N. and Salomonovich, A. E. Measurement of the amplitude of vibration of piezoelectric crystals by an interference method 8590

Borovik, E. S. The Hall effect in indium, 3672

Borovitskiĭ, S. I. On the fluctuations in a linear system with periodically-varying parameters, 2396

Borovitskiĭ, S. I. and Tikhonova, E. I. On the spectral method of investigating statistical phenomena in a gaseous discharge, 2700

Borries, B. von. *See* von Borries, B.

Borrmann, G. Abnormally penetrating X-rays in the Bragg case of interference, 9820

Borsellino, A. On the spread of photons in a shower 430. On the angular and lateral distribution functions of extensive showers, 431

Borsellino, A. and Salvini, G. Consideration of the cascade development of the penetrating componen of extensive showers, 1909

Borst, J. M. *See* Cooper, F. S., 7645

Borzyak, P. G. Experimental investigations of oxygen caesium films, 2694

Bosch, J. C. van den. *See* van den Bosch, J. C.

Bosschart, R. A. J. and Freudenthal, H. The decibel conception and dimensional analysis, 6815

Bosson, G., Gutman, F. and Simmons, L. M. A relationship between resistance and temperature of thermistors, 1063

Boswell, F. W. C. A standard substance for precis electron diffraction measurements, 1104. Precis determination of lattice constants by electron diffraction and variations in the lattice constants of very small crystallites, 6602

Bosworth, R. C. L. A note on the sigma phenomenon 6083. *See also* Johnson, P. R., 6059

Bothe, W. Theory of the double lens β-spectrometer 2736. *See also* Ritter, O., 7939; Schulze-Pillot G., 1105; Stetter, W., 6386

Bothe, W. and Thurn, H. The shape of the Ross curve, 432

Bothner-By, A. A. and Bigeleisen, J. Fractionation of the carbon isotopes in decarboxylation reactions. III. The relative rates of decomposition of carboxyl-C^{12} and -C^{13} mesitoic acids, 7342

Bott, M. J. *See* Robinson, C., 9796

Böttcher, C. J. F. and Scholte, T. G. The polarisabilities and the radii of ions in solution, 5861

Bouchard, J. and Tauzin, P. Combined effect of a high frequency [electric] field and an intense beam of light on particles suspended in air, 920

Bouchez, R. Remarks on the quasi-atomic model and nuclear magnetic moments, 547

Boucke, H. A new conductivity meter for chemical fluids, 3859. A direct-reading capacitance meter for recording the film thickness of photographic emulsions, 9894

Bouigue, R. Transition-probabilities for diatomic symmetrical molecules (vibrational spectra), 8096

Bouke, H. A new skin conductivity and temperature measuring instrument, 8389

Boulloud, A. Influence of cold emission on spark lag in compressed gases, 342. On breakdown lags in compressed nitrogen and compressed hydrogen, 5445

Bouma, B. C. *See* van Geel, W. C., 2686

Bouman, D. J. Helmholtz waves in the atmosphere, 2235

Bouman, M. A. Peripheral contrast thresholds of the human eye, 3242. *See also* Shoemaker, F. C., 8964

Bouricius, G. M. B. and Shoemaker, F. C. A current integrator, 4444

Bouricius, W. G. *See* Bloch, I., 2391, 9687

Bourque, O. J. *See* Quinn, H. F., 776, 4980

Bouška, J. On the apparent effect of the earth on solar activity, 6693

Bousser, F., Della Corte, M. and Jauneau, L. Study of showers in sensitive emulsions, 3610

Boutry, G. A. and Le Blan, L. A black body: a standard of brightness of adjustable temperature, 5227. *See also* Delcroix, J.-L., 7979

Bouvier, P. Concerning the Wolf–Rayet stars, 4063

Bouwers, A. Resolving power in photography, 9889

Bouwkamp, C. J. On Bethe's theory of diffraction by small holes, 1947. On Sommerfeld's surface wave, 1949. On the diffraction of electromagnetic waves by small circular disks and holes, 2852

Bouzitat, J. On the smooth reactions of two solid bodies in contact, 4124

Bovey, E. and Unger, P. The preparation of pinhole-free silver mirrors, 3477

Bovey, L. F. H. The absorption and reflection spectra of the ammonium halides, 4257. Reflection and transmission infrared cells for use at liquid air temperatures, 6116

Bowden, F. P. A discussion on detonation: the initiation of an explosion and its growth to detonation, 3123

Bowden, F. P. and Throssell, W. R. Adsorption of water vapour on solid surfaces, 6542. Adsorption of water vapour on solid surfaces, 7355

Bowden, F. P. and Williams, H. T. Initiation and propagation of explosion in azides and fulminates, 8285

Bowden, F. P. and Young, J. E. Friction of clean metals and the influence of adsorbed films, 8278. Friction of diamond, graphite and carbon and the influence of surface films, 9038

Bowe, P. W. A. The waveforms of atmospherics and the propagation of very low frequency radio waves, 3667

Bowen, E. G. The formation of rain by coalescence, 1543. Radar observations of rain and their relation to mechanisms of rain formation, 3985

Bowen, E. G. and Davidson, K. A. A raindrop spectrograph, 9201

Bowen, E. J. and Metcalf, W. S. The quenching of anthracene fluorescence, 5292

Bowen, J. H. *See also* Harvalik, Z. V., 2247

Bowen, J. H. and Burnup, T. E. A simple analogue computer for Fourier analysis and synthesis, 3258

Bowen, K. W. J. and Hoar, T. P. Low temperature ferromagnetism of sigma phase in an alloy steel, 493

Bowen, R. J. *See* Šimon, I., 3107, 6519

Bowen, T. *See also* Roser, F. X., 5497

Bowen, T. and Roser, F. X. The ionisation loss of μ-mesons at relativistic energies in anthracene, 8228

Bowen, W. A., Jr. *See* Maple, E., 7398; Singer, S. F., 8370

Bowers, K. D. *See* Bleaney, B., 9605

Bowers, R., Chandrasekhar, B. S. and Mendelssohn, K. Pressure measurement in superflow, 2626

Bowers, R. and Mendelssohn, K. Film transfer in helium II. III. Influence of radiation and impurities, 1803. The viscosity of liquid helium between 2 and 5°K, 1806. Heat conductivity of liquid helium I, 2635

Bowers, R. and White, G. K. Pressure gradients in superflow, 6177

Bowker, J. K. *See* Bradner, H., 5790

Bowler-Reed, J. *See* Bockris, J. O'M., 6195

Bowman, H. A. Determination of very small changes in rate over intervals of several days in mechanical timepieces, 2355

Boyd, A. W. *See* Cunningham, G. L., Jr, 6126

Boyd, C. A. Critical behavior and liquid-vapor equilibrium in mixtures of fluids, 1666. *See also* Curtiss, C. F., 6939

Boyd, C. A., Stein, N., Steingrimsson, V. and Rumpel, W. F. An interferometric method of determining diffusion coefficients in gaseous systems, 5165

Boyd, D. R. J., Thompson, H. W. and Williams, R. L. Internal rotation of methyl groups in cadmium dimethyl, 7166 Internal rotation in zinc dimethyl and mercury dimethyl, 7704

Boyd, R. L. F. The mechanism of positive ion collection by a spherical probe in a dense gas, 9560

Boyd, T. F. Color tolerance specifications for paint, 7788

Boyer, G. L. *See* Tamarkin, P., 4194

Boyer, K., Gove, H. E., Harvey, J. A., Deutsch, M. and Livingston, M. S. Instrumentation of the M.I.T. cyclotron for the study of nuclear reactions, 5474

Boyer, R. A. Ultrasonic velocities in gases at low pressures, 5178

Boyer, R. F. Relation of tensile strength to brittle temperature in plasticized polymers, 6514

Boyle, W. S. *See* Gransden, M. M., 5704

Boys, S. F. Electronic wave functions. III. Some theorems on integrals of antisymmetric functions of equivalent orbital form, 4996. IV. Some general theorems for the calculation of Schrödinger integrals between complicated vector-coupled functions for many-electron atoms, 7196. V. Systematic reduction of all Schrödinger integrals of conventional systems of antisymmetric vector coupled functions, 7197

Bozman, W. R. *See* Meggers, W. F., 5249

Bozorth, R. M. Atomic moments of ferromagnetic alloys, 560. Magnetic domain patterns, 6322

Bozorth, R. M. and Walker, J. G. Domain structure of a cobalt-nickel crystal, 507

Bracci, A., Facchini, U. and Germagnoli, E. Determination of the strength of a neutron source, 2065

Bracewell, R. N., Budden, K. G., Ratcliffe, J. A., Straker, T. W. and Weekes, K. The ionospheric propagation of low- and very-low-frequency radio waves over distances less than 1 000 km, 4559

Brackett, F. S. *See* Daniel, J. H., 5875

Bradfield, G. Internal friction of solids (conf. rep.), 8279

Bradford, R., Clay, C., Craft, A., Strick, E. and Underhill, J. Nuclear proton resonance in related liquid hydrocarbons, 8109

Bradley, D. *See* Leah, A. S., 2638

Bradley, L. C., III. *See* Wilets, L., 5104

Bradley, R. S. On the time lag in the precipitation of ice by silver iodide crystals, 1545. Rates of evaporation. IV. The rate of evaporation and vapour pressure of rhombic sulphur, 3483. The rate of growth of nuclei in the dehydration of hydrates, 9124

Bradley, R. S. and Waghorn, G. C. S. The rate of evaporation of droplets. V. Evaporation characteristics of some branched-chain hydrocarbons and a straight-chain fluorocarbon, 3486

Bradner, H. and Bowker, J. K. Meson production accompanying uranium fission, 5790

Bradner, H., O'Connel, D. J. and Rankin, B. On the relative production of π^+- and π^--mesons by neutrons, 633

Bradner, H. and Rankin, B. Large angle scattering of π^--mesons, 3044

Bradshaw, B. C. The effect of grinding on particles, 8269. A study of metallic electrodes prepared by sublimation, 8297

Bradt, H. L. and Peters, B. Abundance of lithium, beryllium boron, and other light nuclei in the primary cosmic radiation and the problem of cosmic-ray origin, 2781

Brady, A. P., Huff, H. and McBain, J. W. Measurement of vapor pressures by means of matched thermistors, 6170

Bragard, L. On the fundamental relation of dynamical geodesy, 3303. On the determination of the equilibrium figure of a fluid mass in uniform rotation, 3304

Bragg, J. K. *See* Coles, D. K., 6869

Bragg, L., Kendrew, J. C. and Perutz, M. F. Polypeptide chain configurations in crystalline proteins, 526

Bragg, W. L. and Rogers, G. L. Elimination of the unwanted image in diffraction microscopy, 3474

Braid, T. H. and Richardson, H. O. W. Further studies—experimental and theoretical—of a wide-angle β-spectrometer which uses a prolate spheroidal magnetic field, 2738

Braithwaite, J. G. N. Infra-red photoconductivity of certain valence intermetallic compounds, 5414

Brajnikov, B. On a possible source of error in the determination of the geological age of uraniferous minerals, 9188

Bralove, A. L. Radioactive dust separation equipment. I, 8400; II, 8401; III, 9876

Bramley, E. N. *See also* Ross, W., 7135

Bramley, E. N. and Ross, W. Measurements of the direction of arrival of short radio waves reflected at the ionosphere, 8068

Bramson, H. and Havens, W. W., Jr. A photographic study of the $\pi^+ \rightarrow \mu^+ \rightarrow \beta^+$ decay process and the energy spectrum of the β^+, 8993

Brancker, A. V. Viscosity-temperature dependence, 1641. Quaternary equilibria data, 3113

Brand, J. C. D. A Coriolis perturbation in the ultra-violet spectrum of formaldehyde, 973. A vibrational analysis of the fluorescence spectrum of formaldehyde, 5299

Brandmüller, J. A model interpretation of the extra magnetic moment of the electron, 6190

Brandmüller, J. and Rüchardt, E. Sommerfeld's fine-structure constant and the problem of spectroscopic units, 559

Brandt, O. and Hagman, T. Design of echo-free rooms for acoustical measurements, 1686

Branscomb, L. M. Anomalous molecular rotation and the temperature of the upper atmosphere, 532. The infrared spectrum of active nitrogen, 4215. Criteria for pre-exposure of spectroscopic plates, 4236

Bransden, B. H. and Burhop, E. H. S. The disintegration of the deuteron by neutron impact, 2055

Branson, N. G. Metal wall thickness measurement from one side by the ultrasonic method, 8540

Branyan, C. E. *See* Cork, J. M., 573, 577, 2017, 4647, 4677, 5708, 8926, 8943, 9672

Brasseur, H. Rapid and precise method for obtaining the ratio c/a for an apatite, 1511. Utilization of the Bragg–Brentano method with sealed fine focus tube, 3916

Brattain, W. H. Semi-conducting materials. Semi-conductor surface phenomena, 7859

Brattain, W. H. and Pearson, G. L. Changes in conductivity of germanium induced by alpha-particle bombardment, 2687

Brauer, P. On the lattice theory of ionic crystals, in particular the halides of the alkaline earths, 8342

Braunbek, W. On the representation of wavefields, 5597

Braune, H., Peter, S. and Neveling, V. Dissociation of sulphur vapour, 5855

Brauns, D. H. Optical rotation and atomic dimension, 555

Braunschweiger, P. G. *See* Rogers, J. D., 4237

Braunstein, J. *See* Frost, A. A., 8879

Braybon, J. E. H. A method for the adjustment of the compensator plate for a Michelson interferometer. 1766

Braybon, J. E. H. and Jerrard, H. G. Some fringes seen in a Soleil compensator, 8659

Brazma, N. A. A new solution of the fundamental problem of the propagation of electromagnetic waves along a set of conductors, 5599

Brdička, M. On gravitational waves, 6725

Brealey, G. J., Evans, M. G. and Uri, N. Photo-reduction of $FeCl_4^-$ in alcohol, 3147

Breckheimer, W. *See* D'Ans, J., 9064

Bredl, J. and Grieve, T. W. A thermal precipitator for the gravimetric estimation of solid particles in flue gases, 3167

Bredov, M. M. A source of alkali-metal ions, 1897

Bredt, I. Hydrogen at high temperatures, 6186

Breit, G. The Fierz and Kopfermann–Brix explanation of the spectroscopic odd-even isotope shift staggering, 545. Evidence concerning equality of *n–n* and *p–p* forces, 3696. Regarding covariant subtraction of infinities, 5073. *See also* Bloch, I., 2391, 9687

Breit, G. and Hull, M. H., Jr. Asymptotic expansion of irregular Coulomb function for angular momentum zero, 1560. Asymptotic expansion of the irregular Coulomb function, 2392

Breit, G. and Yovits, M. C. Internal excitation and apparent range of nuclear forces in scattering experiments, 4093

Bremmer, H. On the theory of optical images affected by artificial influences in the focal plane, 4310. On the diffraction theory of Gaussian optics, 9398. The W.K.B. approximation as the first term of a geometric-optical series, 9619

Bremner, J. W. A method for determining uranium and thorium in rocks by the nuclear photographic plate, 2936

Brenet, J. A theory of depolarization in manganese dioxide cells, 698

Brenet, J. and Briot, A.-M. The valency state of manganese in the so-called "manganese dioxides," 4864. Mechanisms of the depolarizing and catalytic activity of manganese dioxide, 5865. A study on the development of the depolarizing and catalytic activity of the oxygen compounds of manganese, 7332

Bressi, A. and Sacerdote, G. G. Particular acoustical behaviour of a porous material, 6820

Bresson, R. and Jaffray, J. Study of the transition points of solid hexadecane and octadecane, 6921

Bretón, A. S. Technique for the use of an electrode with carbon being used as the reference element in the spectral analysis of solutions, I. 1469; II, 1470

Brewer, A. W. Physics of clouds and precipitation (disc.), 4942

Brewer, A. W. and Dobson, R. H. An automatic frost-point hygrometer for measurements in the upper air, 2200, 9200

Brewer, A. W. and Palmer, H. P. Freezing of super-cooled water, 9420

Brewer, A. W. and Scrase, F. J. Reviews of modern meteorology. I. Meteorological measurements, 3965

Brewer, L. and Mastick, D. F. The stability of gaseous diatomic oxides, 7328

Brewington, G. P. Comments on several friction phenomena, 9037

Breyer, B. and Gutmann, F. Processes in dielectrics containing free charges. The entropy of electrostatic systems, 6194

Breyer, B., Gutman, F. and Hacobian, S. Polarography with alternating currents. I. Outline of theory, apparatus, and technique, 5896; II. A.c. polarography of cadmium, zinc, lead, thallium, indium, bismuth, and antimony, 5897

Bricard, M. J. Propagation of visible and infra-red radiations through fog, 4946

Brice, B. A., Halwer, M. and Speiser, R. Photoelectric light-scattering photometer for determining high molecular weights, 1777

Bridge, H. S. and Annis, M. A cloud-chamber study of the new unstable particles, 6300

Bridgman, P. W. The effect of pressure on the melting of several methyl siloxanes, 4335. The effect of the pressure on the electrical resistance of certain semi-conductors, 6213. The electric resistance to 30 000 kg/cm^2 of twenty-nine metals and intermetallic compounds, 6230

Brière, M., Rogozinski, A. and Weill, J. A portable ionization chamber with logarithmic response, 9549

Briggs, B. H. An investigation of certain properties of the ionosphere by means of a rapid frequency-change experiment, 4923

Briggs, B. H. and Phillips, G. J. A study of the horizontal irregularities of the ionosphere, 767

Briggs, L. J. The limiting negative pressure of acetic acid, benzene, aniline, carbon tetrachloride, and chloroform, 6768

Bright, W. The influence of the electrodes in the discharge between coaxial cylinders in compressed air, 4407

Bril, A. and Kröger, F. A. Saturation of fluorescence in television tubes, 970

Brill, R. The rate equation of ammonia-synthesis on iron-type catalysts of different composition, 8291

Briller, S. A., Marchand, N. and Kossmann, C. E. A differential vectorcardiograph, 1549

Brillouin, L. Maxwell's demon cannot operate: information and entropy. I, 3500: Physical entropy and information; II, 3501. Information theory and most efficient codings for communication or memory devices, 9230

Brimberg, S. On the multiple scattering of fast electrons in aluminium, 3570

Brimley, K. J. *See* Tetlow, K. S., 6103

Brindley, G. W. and Méring, J. X-ray diffraction by structures in disordered layers. I, 9136

Brindley, G. W., Oughton, B. M. and Robinson, K. Polymorphism of the chlorites. I. Ordered structures, 1485

Briner, H. Note on the different effects of sound absorption on the sound of new and old violins, 4203

Brink, F., Jr. *See* Carlson, F. D., 2239

Brinkley, T. A. *See* Titterton, E. W., 5760

Brinkworth, M. J. and Titterton, E. W. The reaction $B^{10}(\gamma,d)2He^4$, 9702

Briot, A.-M. *See* Brenet, J., 4864, 5865, 7332

Bristow, J. R. Frictional relaxation oscillations, 1383

Brittain, J. W. *See* Ghiorso, A., 6404

Brix, P. and Engler, H. D. On the isotope shift in the Gd I spectrum, 7678

Brix, P. and Humbach, W. On the isotope shift in the Cu I resonance lines, 2513

Brix, P., Kopfermann, H., Martin, R. and Walcher, W. On the nuclear moments of the Ag isotopes and the isotope shift in the spectrum of silver, 4597

Brix, P., Kopfermann, H. and v. Siemens, W. On the nuclear moments of iridium isotopes, 1244

Brochard, J. Studies of forbidden lines and the interionic field in discharge tubes, 4243

Brochard, J., Giacomo, P., Jacquinot, P. and Riozen, S. Evaporation in vacuum bombardment from an electron gun, 8247

Brockdorff, U. v. *See* v. Brockdorff, U.

Brockhouse, B. N. *See also* Peppiatt, H. J., 8080

Brockhouse, B. N. and Hurst, D. G. Resonant scattering in samarium and gadolinium, 8984

Brockhouse, B. N., Hurst, D. G. and Bloom, M. Resonant scattering of slow neutrons by cadmium, 8983

Brockman, F. G. Structure and properties of ferrites, 8031

Broda, E. *See also* Rieder, W., 9070

Broda, E. and Jenkner, K. The detection of rare α-activity with the help of the photographic plate, 6401. *See also* Giegerl, E., 4767

Brode, R. B. The multiplicity of production and mass spectrum of cosmic ray mesons, 471. *See also* Merkle, T. C., Jr, 415

Brodersen, S. and Langseth, A. Localization of the electronic lines in continuous absorption spectra by the temperature-effect, 7698

Brodie, W. D. *See* Butt, D. K., 9679

Brodskiĭ, A. M. *See* Ivanenko, D. D., 3350

Brody, J. K. *See* Fred, M., 5251

Broer, L. J. F. On the dynamical behaviour of a canonical ensemble, 8536. On the influence of acoustic relaxation on compressible flow, 8579. On the propagation of energy in linear conservative waves, 8591

Broglie, L. de. *See* de Broglie, L.

Broida, H. P. Hydrogen-oxygen reaction at the second explosion limit, 7338

Broida, H. P., Levedahl, W. J. and Howard, F. L. The emission spectra of first-stage combustion in an engine, 6927

Broida, H. P. and Oldenberg, O. The thermal hydrogen-oxygen reaction at relatively low temperatures, 4827

Brolley, J. E., Jr, Coon, J. H. and Fowler, J. L. Neutron-proton scattering at 27 MeV, 4742

Brolley, J. E., Jr, Cooper, D. H., Hall, W. S., Livingston, M. S. and Schlacks, L. K. A search for short period activities from U^{235} fission products, 8917

Brolley, J. E., Jr, Fowler, J. L. and Stovall, E. J., Jr. The angular distribution of the products of the $T(d, n)He^4$ reaction, 5758

Bromley, D. A. Energy spectrum of neutrons from a thorium active deposit-beryllium source, 8185

Broniewski, A. On the correlation between the discontinuities in the mass valley and nuclear shells. Application to the study of the systematics of α emission, 8890

Bronk, D. W. *See* Carlson, F. D., 2239

Brook, A. G. and Wright, G. F. The configurations of the diastereomeric 1-chloromercuri-2-methoxycyclohexanes, 2188

Brooks, J. E. and Domb, C. Order-disorder statistics. III. The antiferromagnetic and order-disorder transitions, 6760

Brooks, R. Absorption edges on Debye–Scherrer X-ray photographs, 6572

Brooks, R., Clark, L. M. and Thurston, E. F. Calcium carbonate and its hydrates, 1488

Broom, T. Anisotropy of electric resistivity of cold-rolled cubic metals and alloys, 2680

Broomhead, J. M. The structures of pyrimidines and purines. IV. The crystal structure of guanine hydrochloride and its relation to that of adenine hydrochloride, 3939

Brophy, J. J. A comparison of theories of secondary emission, 6263. Secondary emission of electrons from liquid metal surfaces, 7942

Broser, I. and Kallmann, H. The destruction of luminescence in phosphors by alpha-particles, 209

Broser, I. and Warminsky, R. The variation of luminescence and electrical conductivity CdS crystals with alpha-particle irradiation, 5298

Brosi, A. R. *See also* Ketelle, B. H., 2000; Zeldes, H., 572, 4663

Brosi, A. R., Borkowski, C. J., Conn, E. E. and Criess, J. C., Jr. Characteristics of Ni^{59} and Ni^{63}, 4645

Brosi, A. R., Zeldes, H. and Ketelle, B. H. $Argon^{39}$ beta-spectrum, 586

Brostrøm, K. J., Madsen, B. S. and Madsen, C. B. Yields of α-, *n*-, and γ-radiation from chlorine bombarded with protons, 9692

Brouckère, L. de. *See* de Brouckère, L.

Brow, J. E. *See* Schwertz, F. A., 5166

Brown, A. On the determination of the convergent point of a moving cluster from proper motions, 42

Brown, A. B., Snyder, C. W., Fowler, W. A. and Lauritsen, C. C. Excited states of the mirror nuclei, Li^7 and Be^7, 4710

Brown, A. F. C. Measurement of the curvature of stress trajectories in photoelastic models, 6046

Brown, C. Equilibrium at low pressure in the reduction of barium oxide by carbon, 1387

Brown, C. J. The crystal structure of *p*-aminophenol, 3940

Brown, C. S., Kell, R. C., Thomas, L. A., Wooster, N. and Wooster, W. A. Growth of large quartz crystals, 7375

Brown, E. B. Improvements in null indicator electromagnetic gauges, 8539

Brown, F. W. *See* Greenfield, M. A., 1715; Parkins, W. E., 8272

Brown, G. E. and Ravenhall, D. G. On the interaction of two electrons, 8515

Brown, G. G. *See* Geist, J. M., 9077

Brown, G. M. *See* Beynon, W. J. G., 9204

Brown, H. *See* Inghram, M. G., 3730

Brown, I. C. A radar echo from lightning, 5944

Brown, J. B. and Mendelssohn, K. Film transfer in helium II. II. Influence of geometrical form and temperature gradient, 1802

Brown, J. F. and Clark, D. Identification and crystal habit of chromium carbide, $Cr_{23}C_6$, as determined by electron diffraction, 6500

Brown, J. H. U., Hatch, T. F. and Cook, K. M. A new apparatus for the partitioning of expired air, 4978

Brown, J. K. and Sheppard, N. Rotational isomerism in 2-methyl butane and 2 : 3-dimethyl butane, 7363. Some infra-red spectroscopic studies of rotational isomerism, 7734

Brown, J. K., Sheppard, N. and Simpson, D. M. The interpretation of the vibrational spectra of the *n*-paraffins, 7726

Brown, R. D. Bond localization energy. I. Definition, methods of computation, and relation to bond order, 719. Asymptotic expressions for the energies of certain long molecules, 2882. Empirical methods of estimating resonance energies. I. Annelation energy, 3690

Brown, R. E. *See* Thomas, L. B., 898

Brown, R. H. and Hazard, C. Radio-frequency radiation from the great nebula in Andromeda (M.31), 1576

Brown, R. J. S. *See* Claassen, R. S., 5481

Brown, S. C. *See* Lax, B., 1074; Varnerin, L. J., Jr, 402

Brown, W. F. The general consistency relations for shock waves, 5181

Brown, W. F., Jr. Dielectric constants of non-polar fluids. I. Theory, 288; II. Analysis of experimental data, 289. Dislocations, cavities and the approach to magnetic saturation, 5590. Electric and magnetic forces: a direct calculation. I, 9451; II, 9452

Brown, W. L. The H_ρ of the high energy internal conversion electrons from thorium D, 7227

Brown, W. N., Jr and Birtley, W. B. A densitometer which records directly in units of emulsion exposures, 4982

Brown, W. W. *See* Lewis, H. W., 4467

Browne, C. P. *See also* Richards, H. T., 2035

Browne, C. P., Williamson, R. M., Craig, D. S. and Donahue, D. J. Low excited states in Li^6 and Be^9, 7262

Browne, S. H. and Gilvarry, J. J., 59

Brownell, C. L. and Maletskos, C. J. Half-life Fe^{55} and Co^{60}, 3725

Brownlee, L. D. Lattice constant of grey tin, 752

Broxon, J. W. Barometric and temperature coefficients of frequency of small cosmic-ray bursts and of burst-corrected cosmic-ray ionization, 4502; Erratum, 7049

Broyles, A. A. *See* Bloch, I., 2391, 9687

Broyles, C. D. *See* Thomas, D. A., 7216

Brož, J. and Vilím, F. A new method for the quick estimation of coercive force, 8018

Brú, L. and Charpurey, K. G. Epitaxy of silver on (110) and (111) faces of rock salt, 5930

Brú, L. and Charpurey, M. K. Epitaxial crystal growth of silver on rock-salt (110) and (111) faces, 3907

Brú, L., Cubero, M. and Vega, R. Contribution to the study of X-ray microscopy. IV. Structure of rutile (TiO_2), 3918

Brubaker, W. M. Potential and gradient distributions in parallel plane diodes at currents below space-charge-limited values, 7042. Stability of short arcs in oxygen, hydrogen, and helium, 8750

Bruce, C. F. Transmission-like multiple-beam reflexion interference fringes, 4305. Transmission-like multiple beam reflection interferometry, 8660. Applications of multiple-beam interferometry, 9396

Bruce, C. F. and Cuninghame, W. A. F. Measurement of angle by interferometry, 4130

Bruce, C. F., Macinante, J. A. and Kelly, J. C. Vibration measurement by interferometry, 6080

Bruce, F. M. A photographic method for displacement/time recording, 863. A review of spark discharge phenomena, 7918

Bruce, V. G. A graphical method for solving vibration problems of a single degree of freedom, 7624

Brüche, E. The position of electron microscopy in Germany, 4439

Bruckshaw, J. McG. and Rao, B. S. Magnetic hysteresis of igneous rocks, 1526

Brueckner, K. Production of π-mesons in nucleon-nucleon collisions, 5800

Brueckner, K., Serber, R. and Watson, K. The capture of π-mesons in deuterium, 4692

Brueckner, K. A. The production of mesons by photons, 82. *See also* Watson, K. M., 6748

Brueckner, K. A. and Case, K. M. Neutral photomeson production and nucleon isobars, 8525

Brueckner, K. A. and Low, F. E. Singular potentials and the theory of the effective range, 7533

Brues, A. M. *See* Warren, S., 1986

Bruggencate, P. ten. *See* ten Bruggencate, P.

Bruijn, H., de. *See* de Bruijn, H.

Bruijsten, J. *See* Kronig, R., 8683

Brulin, O. and Hjalmars, S. On the relativistic invariance of the quantization in the meson pair theory, 6023

Bruma, M. On the principles of a null method for the determination of dielectric constants at ultra high frequencies. I, 3506; II, 3507. *See also* Magat, M., 8055

Brumberg, E. M., Berezhnaya, I. N., Dutkinskiĭ, V. P. and Manoĭlov, S. E. Use of ultra-violet rays in chromatographic analysis in the adsorption column, 3185

Brunauer, S. *See* Maxwell, L. R., 4836

Brunelli, B. *See also* Ballario, C., 8008, 9575

Brunelli, B. and Cunsolo, D. The internal conversion of kinetic energy of electrons of beta-active substances, 2010

Bruner, J. A. and Langer, L. M. Radioactivity of scandium^{44}, 584

Brunt, J. J. and Downer, A. N. An examination of weld metal by means of the electron microscope, 6499

Brunton, D. C. and Thompson, W. B. Energy distribution of fission fragments from Pu^{239}, 1312

Bruscaglioni, R. Photographic field depth, 2268

Brussèt, H. and Kikindai, T. Low-angle scattering of X-rays by some mineral colloids, 1088

Bruzek, A. Observations of the behaviour of filaments during chromospheric eruptions, 7468

Bryan, J. M. *See* Koppe, H., 8865; Opechowski, W., 8038

Bryce, W. A. *See* Collins, S., 1210

Bube, R. H. Luminescence and trapping in zinc sulfide phosphors with and without copper activator, 1752. Effect of infra-red on emission and trapping in ZnS : Cu phosphors, 2556. Photo-luminescence efficiency of ZnS.Cu phosphors as a function of temperature, 4290. A comparative study of photoconductivity and luminescence, 6886. The role of chlorine in the luminescence of ZnS–Cu phosphors, 7762

Buch, S. On the colour of reflection-reducing films, 5313

Buchanan, A. S. *See* Danby, C. J., 8302

Buchmann, E. *See* Perls, T. A., 7581

Buckel, W. and Hilsch, R. Superconductivity of copper sulphide, 319

Buckingham, M. J. The surface photoelectric effect, 1842. Theoretical aspects of superconductivity. Specific heat of metals at low temperatures, 9494. *See also* Makinson, R. E. B., 2695

Budde, W. Investigations of the spreading of sky-waves, I, 4922; II, 8380

Budden, K. G. The propagation of a radio-atmospheric, 2863. The reflection of very low frequency radio waves at the surface of a sharply bounded ionosphere with superimposed magnetic field, 8861. *See also* Bracewell, R. N., 4559

Budini, P. The electronic component of cosmic radiation, 1903. Structure of the tracks generated by high-energy ionizing particles, 2030. On the density spectrum of extensive air showers, 8816

Budó, A. and Kovács, I. Perturbations in band-spectra, 7672

Bueche, A. M. *See* Debye, P., 2588

Bueche, F. *See also* Debye, P., 5642, 6200

Bueche, F., Debye, P. and Cashin, W. M. Expressions for turbidities, 6902

Buechner, W. W. *See* Adamson, R. E., Jr, 2999; Endt, P. M., 8193; Enge, H., 7264; Malm, R., 3010, 4714; Sperduto, A., 3009; Strait, E. N., 4706; Van Patter, D. M., 606, 3712, 4718

Buehler, E. *See* Teal, G. K., 4385

Buehler, R. J. *See also* Wentorf, R. H., Jr, 2648

Buehler, R. J. and Hirschfelder, J. O. Bipolar expansion of Coulombic potentials, 7530

Buehler, R. J., Wentorf, R. H., Jr, Hirschfelder, J. O. and Curtiss, C. F. The free volume for rigid sphere molecules, 4175

Buerger, M. J. Tables of the characteristics of the vector representations of the 230 space groups, 1495. Limitation of electron density by the Patterson function, 3206

Buerschaper, R. A. A rapid method for calculating and using platinum thermohm tables, 3498

Buettner, K. Radiation effects on man in space, 8388

Buff, F. P. *See* Kirkwood, J. G., 6071

Bugosh, J. *See* Yeager, E., 2476

Bulgakov, B. V. Discriminant curve and domain of aperiodic continuity, 2294

Bulgakov, N. V. The magnetic anisotropy constant of highly coercive alloys, 494

Bull, C. and Garlick, G. F. J. The luminescence of diamonds, 968

Bull, T. H. and Marshall, D. G. Life-time of potassium ions on a tungsten filament at 1 460°K, 5513

Bullen, K. E. Origin of the moon, 2321. Venus and the Earth's inner core, 2323. Theoretical travel-times of *S* waves in the earth's inner core, 3952. Theoretical amplitudes of the seismic phase *PKJKP*, 9840

Bullock, B. W. and Silverman, S. A rapid scanning spectrometer for oscillographic presentation in the near infra-red, 938

Bullrich, K. Scattering of light on vapour and ice particles, 3235. The role of haze and ice particles in the atmosphere in the scattering of light, 3989

Bulyginskiĭ, D. G. *See* Kulchitskiĭ, L. A., 583

Bundy, F. P., Strong, H. M. and Gregg, A. B. Measurement of velocity and pressure of gases in rocket flames by spectroscopic methods, 7814

Bunimovich, V. I. Sensitivity of a radiometer, 3652

Bunker, M. E. and Canada, R. Radiation from Mo^{99} and Tc^{99m}, 2973

Bunker, M. E., Canada, R. and Mitchell, A. C. G. Radiations from Os^{185}, Os^{191}, and Os^{193}, 588

Bunker, M. E., Langer, L. M. and Moffat, R. D. The beta-disintegration of Th^{233}, 1998. The disintegration of Rb^{88}, 2974

Bunton, C. A. *See* Hughes, E. D., 1391

Burbank, R. D. The crystal structure of α-monoclinic selenium, 3924

Burch, F. H. *See* Bigg, P. H., 6052

Burcham, W. E. *See* Freeman, J. M., 5709

Burcik, E. J. The rate of surface tension lowering and its role in foaming, 2138

Burck, W. Progress in the field of loudspeaker construction and its physical principles, 2474

Burdese, A. *See* Cirilli, V., 9153

Burdick, M. D., Zweig, B. and Moreland, R. E. Linear thermal expansion of artificial graphites to 1 370°c, 9418

Burditt, W. F. *See* McMahon, A. J., 1167

Burdy, L. M. J. *See* Minter, C. C., 3889

Burge, E. J. and Jackson, L. C. The thickness of the helium film, 2629

Burgers, J. M. On a correlation problem in a model of turbulence, 2454

Burgess, R. E. The capacitance of selenium rectifiers, 2689. The measurement of fluctuation noise by diode and anode-bend voltmeters, 6982

Burgy, M. T. *See also* Hughes, D. J., 2069, 4763

Burgy, M. T., Hughes, D. J., Wallace, J. R., Heller, R. B. and Woolf, W. E. Double transmission and depolarization of neutrons, 3054

Burhop, E. H. S. *See* Bransden, B. H., 2055

Burhorn, F. and Maecker, H. Field strength measurements in water-stabilized heavy loading arcs, 6236

Burkard, O. Thermal separation of ionospheric layers, 3980. Electron annihilation in the *F*2-layer, 6631

Burke, T. G. *See* Jones, E. A., 963

Burkhalter, J. H., Anderson, R. S., Smith, W. V. and Gordy, W. The fine structure of the microwave absorption spectrum of oxygen, 202

Burking, J. W. and Wright, B. T. Survey experiments on elastic scattering, 6267

Burkitt, F. H., Coulson, C. A. and Longuet-Higgins, H. C. Free valence in unsaturated hydrocarbons, 9093

Burman, U. R. On the construction of models with a discontinuity of the molecular weight for stars with given values of their mass, radius and luminosity, 7493

Burn, G. P. Auxiliary circuits for *p*H meter, 8322

Burnam, T. D. *See* Kenworthy, R. W., 8606

Burnelle, L. *See also* Duchesne, J., 9094

Burnelle, L. and Duchesne, J. The angle-angle interaction in the vibration potential function of pyramidal molecules, 1213

Burnett, C. R. Isotope shift in the atomic spectrum of carbon, 1725

Burnett, G. M. The non-stationary phase of chain reactions. I. The photopolymerization of styrene, 707

Burnett, J. D. and Melville, H. W. The photopolymerization of vinylidene chloride. I, 3149

Burnett, W. T., Jr. *See* Bizzell, O. M., 7225

Burns, W. G. and Bernstein, H. J. The vibrational spectra and structure of inorganic molecules. III. The infra-red spectra of nitrosyl chloride and nitrosyl bromide from 2·0 to 25μ, 2541

Burnup, T. E. *See* Bowen, J. H., 3258

Burr, B. E. *See* Pratt, A. W., 9864

Burrell, C. M., Majury, T. G. and Melville, H. W. A dielectric constant method of following the non-stationary state in polymerization. I. The theory of the method, 3509

Burrows, H. B., Gibson, W. M. and Rotblat, J. Angular distribution of protons from the reaction O^{16}(*d*, *n*) O^{17}, 3017

Burson, S. B., Blair, K. W., Keller, H. B. and Wexler, S. The radiations from hafnium, 7219

Burstein, E. and Oberly, J. J. Nature of trapped hole colour centres in the alkali halides, 731

Burstein, E., Oberly, J. J., Henvis, B. W. and Davisson, J. W. A note on the distribution of impurities in alkali halides, 5900

Burton, L. *See* Birkhoff, G., 4121

Burton, M. Radiation chemistry. II. Elementary processes in the radiation chemistry of water and implications for radiobiology, 9775. *See also* Hentz, R. R., 5867; Magee, J. L., 5874; Sworski, T. J., 9777

Burton, W. K., Cabrera, N. and Frank, F. C. The growth of crystals and the equilibrium structure of their surfaces, 6560

Burwell, R. L., Jr, Metlay, M. and Pfohl, F. W. The measurement of rates of flow of gases by wet test meters, 138

Busala, A. *See* Talbot, F. L., 4707

Busch, G. *See also* Stähelin, P., 1049

Busch, G., Wieland, J. and Zoller, H. Experiments on the measurement of the electrical conductivity of grey tin, 1048. Electrical properties of grey tin, 3524. Semi-conducting materials. Electrical space properties of grey tin, 7869

Bush, H. D. Departure from the Rayleigh law of the magnetization of a ferromagnetic material, 502

Bushkovitch, A. V. *See* Potter, C. A., 8640

Butcher, P. N. The absorption of light by alkali metals, 9626

Butement, F. D. S. Radioactive samarium-145 and promethium-145, 4654*. Radioactive ^{159}Dy, 5691. New radioactive isotopes produced by nuclear photo-disintegration, 5693

Butler, C. C. *See* Armenteros, R., 6297; Barker, K. H., 2796

Butler, H. E. Recording of scintillations, 2251. Photoelectric observations of the scintillation of stars, 4947. The equivalent widths of calcium and hydrogen absorption lines in the near infra-red of stellar spectra, 6708

Butler, J. A. V. and Randall, J. T. (ed.). Progress in biophysics and biophysical chemistry. I, 6655

Butler, J. P., Schiff, H. I. and Gordon, A. R. Equivalent and ionic conductances for sodium and potassium chlorides in anhydrous methanol at 25°c, 7346

Butler, J. W. *See* Bonner, T. W., 8959

Butler, K. H. and Jerome, C. W. Calcium halophosphate phosphors. I. Analysis of emission spectra, 217

Butler, O. I. and Sarma, M. R. Relaxation methods applied to the problem of a.c. magnetization of ferromagnetic laminae, 1940, 6355

Butler, S. T. On angular distributions from (*d*, *p*) and (*d*, *n*) nuclear reactions, 3016, 8973

Butler, S. T. and Symonds, J. L. Angular distribution for (*d*, *p*) and (*d*, *n*) reactions in light nuclei, 8971

Butsyk, M. and Gertsriken, S. Investigation of the zinc-diffusion in silver-zinc alloys with admixtures, 2079

Butt, D. K. and Brodie, W. D. The conversion and Auger electrons of radium D, 9679

Buzzell, A. and Sturtevant, J. M. A new calorimetric method, 7824

Byard, S. Note on the impedance variations of an electro-acoustic transducer in a reflecting field, 5198

Byerly, P. R., Jr and Stephens, W. E. Photo-disintegration of copper, 4721, 7270

Byfield, H. *See* Lederman, L. M., 8991

Bykhovskiĭ, M. L. Accuracy of electric circuits destined for solving Laplace equations, 12

Byram, E. T. *See* Friedman, H., 9202

Byrne, J. T. Preparation of carrier-free manganese 52, 4690

Byström, A. The decomposition of lead peroxide and oxidation products of lead oxide, 1456. On the stereochemistry of lead and some metals with similar atomic structure, 1458. Studies on oxides and fluorides of lead, 1499. The structure of quenselite $PbMnO_2OH$, 1507. Crystal structure of valentinite and complex antimony (iii) fluorides, 6595

Byström, A. and Wilhelmi, K.-A. The crystal structure of KSb_4F_{13} and isomorphous compounds, 3933

Byutner, E. K. *See* Volkenshteĭn, M. V., 6154

Bywater, S. and Steacie, E. W. R. The mercury $(^3P_1)$ sensitized decomposition of normal and iso-butane at high temperatures, 4848. The mercury $(^3P_1)$ photo-sensitized decomposition of propane at high temperatures, 4851. The mercury $(^3P_1)$ photo-sensitized reaction of ethane at high temperatures, 4852

Cabannes, H. The problem of the detached shock wave for the case of resolute flows, 4166. An investigation of the curvature at the apex of the attached shock-wave in axially-symmetric flow, 4169. Determination of the shock wave ahead of an obstacle of revolution when the velocity at the point of the obstacle is subsonic, 9334

Cabannes, J. Applications of spectral analysis to the study of crystals, 6138

Cabarat, R. *See* Chatelet, J., 8258

Cabello, J. and Stiles, W. S. Threshold sensitivity of the rods and cones in the parafovea, 2250

Cabrera, N. Evaporation and mobility of napthalene molecules, 6169. *See also* Burton, W. K., 6560; Volet, C., 6896

Cachon, A. *See* Armenteros, R., 6297

Cade, R. Curvilinear momenta in quantum mechanics, 7564. On mechanical action in dielectrics, 9439

Cadle, R. D. and Magill, P. L. Preparation of solid- and liquid-in-air suspensions for use in air pollution studies, 9078

Cadwell, J. H. and Spring, K. H. Distribution of range-finding errors, 1633

Cady, W. G. Piezoelectric equations of state and their application to thickness-vibration transducers, 142

Cady, W. M. *See* Blitzer, L., 6836; Gordon, G., 2505

Cagle, F. W., Jr and Eyring, H. An application of the absolute reaction rate theory to some problems in annealing, 6488

Cahn, R. W. Internal strains and recrystallization, 7439

Caianiello, E. R. Beta-decay and meson decay, 4670. On the spin of the μ-meson, 8230. On the universal Fermi-type interaction. I, 8513. *See also* Messiah, A. M. L., 8225

Caillat, R., Lallement, C. and Valladas, G. The construction and use of small boron trifluoride chambers, 5492

Calcraft, M. E. and Titterton, E. W. The reactions $^{11}B(\gamma\alpha)^7Li$ and $^{11}B(\gamma T)^8Be$, 8974

Caldecourt, V. J. A mass indicator, 379. An electron current regulator for mass spectrometer ion sources, 4448. *See also* Matheson, L. A., 9437

Caldin, E. F. *See* Bell, R. P., 3856

Caldirola, P. Production of the meson component, 476. *See also* Bernasconi, A., 4100

Caldirola, P., Fieschi, R. and Gulmanelli, P. Latitude effect of the distribution of mesons in the atmosphere, 9574

Caldirola, P. and Gulmanelli, P. Distribution in the atmosphere of cosmic-ray meson and electron components, 5517

Caldirola, P. and Zin, G. Effect of latitude on the nucleonic component of cosmic radiation, 449

Callaway, D. B. Spectra and loudnesses of modern automobile horns, 4216

Callaway, D. B., Tyzzer, F. G. and Hardy, H. C. Resonant vibrations in a water-filled piping system, 8589

Callen, H. B. Polaron states in ionic crystals, 736 *See also* Greene, R. F., 9434

Callen, H. B. and Welton, T. A. Irreversibility and generalized noise, 6759

Callomon, H. J., McKean, D. C. and Thompson, H. W. Intensities of vibration bands. III. Nitrous oxide, 7751; IV. Carbonyl sulphide and acetylene, 7753

Calnan, E. A. and Clews, C. J. B. Deformation textures in face-centred cubic metals, 1373. The development of deformation textures in metals. II. Body-centred cubic metals, 9030; III. Hexagonal structures, 9752

Calvert, J. G. and Steacie, E. W. R. Vapor phase photolysis of formaldehyde at wavelength 3130 Å, 4849

Calvert, W. L. *See* Rugg, F. M., 4238

Calvet, E. Thermal effects during adsorption. I. Application for the measurement of the surface area of powders, 5881

Calvin, M. and Alter, H. W. Substituted stilbenes. I. Absorption spectra, 7361; II. Thermal isomerization, 7362

Camac, M. Double focusing with wedge-shaped magnetic field, 4431

Camac, M., Corson, D. R., Littauer, R. M., Shapiro, A. M., Silverman, A., Wilson, R. R. and Woodward, W. M. Interaction of pi-meson with carbon and aluminum nuclei, 6449

Camerer, L. *See* Schöntag, A., 5242

Cameron, A. G. W. Interpretation of photoneutron yields, 5771. *See also* Millar, C. H., 1292

Cameron, A. G. W., Harms, W. and Katz, L. Photo-proton reactions in lead, 9708

Cameron, A. G. W. and Katz, L. Half-life of Cu^{66}, 2953

Camm, G. L. Self gravitating star systems, 3290

Camolet, R. Dynamometer with variable sensitivity, 2407

Campanelli, L. *See* Livrea, G., 4970

Campbell, A. S. Thermodynamic properties of reactive gas mixtures, 6935

Campbell, D. Track autoradiography with iron-59 and sulphur-35 with quantitative evaluation, 4022

Campbell, H. N. X-ray absorption in crystals set at the Bragg angle, 3553, 9821

Campbell, I. G. *See* White, D. F., 1468

Camuñas Puig, A. *See* López de Azcona, J. M., 1719

Camus, A.-M., Françon, M., Ingelstam, E. and Maréchal, A. A study by phase contrast of the errors in the rulings of gratings, 5324

Canac, A., Maret, G. and Goldzahl, L. An effect of X-rays on a discharge in very low pressure, 1861

Canada, R. *See also* Bunker, M. E., 588, 2973; Cuffey, W. H., 8944

Canada, R., Cuffey, W. H., Lessor, A. E. and Mitchell, A. C. G. The energy of the gamma-ray from Se^{77m}, 6441

Canada, R. and Mitchell, A. C. G. The disintegration As^{77}, 4648. Nuclear spectroscopy of Ba^{131} and Cs^{131}, 7220. Radiations from Br^{77} and Ni^{57}, 8936

Canavaggia, R. *See* Berger, J., 1590, 6706, 7494

Candler, C. A unit of wave-number, 6014, 7500

Canepa, F. G. *See* Joel, N., 6599

Canetti, G. S. *See* Whitehead, L. G., 867

Caplehorn, W. F. and Rundle, G. P. The angular distribution of 3 MeV neutrons scattered by protons and by deuterons, 6484

Capron, P. C. and Verhoeve-Stokkink, A. J. The existence of different capture levels in the formation of nuclear isomers by slow neutron irradiation, 4732

Carbenay, F. The statistical action of atmospherics on a receiver tuned to 27 kc/s, 5945

Cardús, J. Oriol. *See* Oriol Cardús, J.

Cariat, J. *See* Jaffray, J., 2612

Cario, G., Euler, J. and Fricke, H. Investigation of the properties of coloured potassium chlorate crystals, 9409

Cario, G. and Reinecke, L. H. The dissociation energies of the nitrogen molecule and its significance for the afterglow of active nitrogen, 527

Carleton, J. T. *See* Harder, E. L., 2299

Carlisle, C. H. and Scouloudi, H. The crystal structure of ribonuclease. I, 7392

Carlisle, R. W. and Pearson, H. A. A strain-gauge type artificial mastoid, 5216

Carlsen, T. On the Christiansen filter and a modification thereof, 3438

Carlson, B. C. and Rushbrooke, G. S. On the expansion of a Coulomb potential in spherical harmonics, 4

Carlson, F. D., Brink, F., Jr and Bronk, D. W. A continuous flow respirometer utilizing the oxygen cathode, 2239

Carlson, G. A 200-kV neutron generator. I, 1320. *See also* Bartholdson, I., 1321

Carlsson, A. *See* Wiedling, T., 7243; Slätis, H., 4695, 8958

Carmack, M. *See* Woodrow, C. C., 7171

Carman, P. C. Physical adsorption of gases on porous solids. II. Calculation of pore-size distributions, 9791

Carman, P. C. and Raal, F. A. Role of capillary condensation in physical adsorption, 3162. Diffusion and flow of gases and vapours through micropores. III. Surface diffusion coefficients and activation energies, 9325. Physical adsorption of gases on porous solids. I. Comparison of loose powders and porous plugs, 9790

Carman, P. D. and Carruthers, R. A. F. Brightnesses of fine detail in air photography, 5969. Aircraft camera mounts—their design and testing, 5970

Carmouze, G. and Daudin, J. Rossi curve for showers of many particles, 1157. The separation of components in extensive showers, 7997

Caro, D. E., Parry, J. K. and Rathgeber, H. The momentum spectrum and positive excess of cosmic ray mesons at sea-level, 5516

Carome, E. F. An electronic vibration meter, 144

Carpenter, F. G. and Deitz, V. R. Methods of sieve analysis with particular reference to bone char, 3059

Carpenter, J. F. *See* Purbrick, R. L., 7965

Carpenter, G. B. *See* Walnut, T. H., Jr, 1491

Carpenter, L. G. and Mair, W. N. The evaporation of titanium, 3484

Carr, C. I., Jr and Zimm, B. H. Absolute intensity of light scattering from pure liquids and solutions, 2590

Carr, E. F. and Kikuchi, C. Angular dependence of hyperfine structure for the copper ion, 2512

Carr, M. E. J. A simplified chemical method of radiation dosimetry, 4631

Carr, W. J., Jr and Smoluchowski, R. The magnetostriction of single crystals of iron-silicon alloys, 9624

Carrara, N. Dispersive media which do not show the Fizeau–Fresnel effect, 8852

Carreker, R. P., Jr. Plastic flow of platinum wires, 1368

Carrelli, A. The universal constants. I–II, 824

Carrelli, A. and Rescigno, L. Measurement of conductivity at high frequencies with solutions of considerable viscosity, 8293

Carroll, B. H. *See* West, W., 4981

Carrus, P. A., Fox, P. A., Haas, F. and Kopal, Z. Propagation of shock waves in the generalized Roche model, 3300. The propagation of shock waves in a stellar model with continuous density distribution, 6714

Carruthers, J. A. *See* Woonton, G. A. 4550

Carruthers, R. *See* Goward, F. K., 1093

Carruthers, R. A. F. *See* Carman, P. D., 5969–70

Carss, W. L., Gum, J. R. and Pool M. L. Beta-decay of isomeric Cd^{113}, 2968

Carter, A. H. and Williams, A. O., Jr. A new expansion for the velocity potential of a piston source, 5194

Carter, H. J. *See* Barrett, E. W., 4936

Carteret, Y. *See* Imelik, B., 1353

Cartier, F. A. *See* Denes, P., 3414

Cartledge, G. H. The correlation of thermochemical data by the ionic potential, 6521

Cartwright, H. M. The reproduction of colour photographs, 1557

Cartwright, W. F. π^+ Meson mass determination, 6474

Carvalho Ferreira, R. de. *See* de Carvalho Ferreira, R.

Carver, J. H. *See also* Wilkinson, D. H., 8908, 8975

Carver, J. H. and Wilkinson, D. H. Some gamma-rays from light elements under proton bombardments, 3005. Photodisintegration of the deuteron at some intermediate energies and the neutron-proton effective triplet range, 3775

Carwile, N. L. *See* Geil, G. W., 2105

Casado, F. L., Massie, D. S. and Whytlaw-Gray, R. The densities and limiting densities of vapours, 6777

Case, K. M. Singular potentials, 2393. *See also* Brueckner, K. A., 8525

Case, K. M. and Messiah, A. M. L. Energy levels of a vector particle in a pure Coulomb field, 6044

Case, K. M. and Pais, A. On spin-orbit interactions and nucleon-nucleon scattering, 852

Casertano, L. *See* Imbó, G., 3716

Casesnoves, D. M. The quantification of space and time in wave mechanics, 4106. The quantification of mass and velocity and the uncertainty of absolute repose, in wave mechanics, 4107. The cosmological and cosmogonical consequences of my theory of the discontinuity of the wave-mechanics variables.—Calculation of the photon mass upper limit, 4108. Original calculation of the number of electrons and protons in the universe—Demonstration that the position of the photon cannot be observed in wave mechanics, 4109

Casey, J. P. *See* Lewis, E. A., 7118

Cashin, W. M. *See* Bueche, F., 6902; Debye, P., 4313; Hoard, J. L., 9171

Casimir, H. B. G. The influence of magnetic and electrical properties of atomic nuclei on the energy levels of atoms and molecules, 1253. On the theory of electromagnetic waves in resonant cavities, 8056

Casler, R., Pringsheim, P. and Yuster, P. *V*-centers in alkali halides, 2522

Caspari, M. E. and Merz, W. J. The electromechanical behavior of $BaTiO_3$ single-domain crystals, 2678

Cassels, J. M. The inelastic scattering of very slow neutrons by aluminium, 9003. The scattering of neutrons by crystals, 9734. *See also* Randle, T. C., 8960; Taylor, A. E., 3038, 5743, 8207

Cassels, J. M., Dickson, J. M. and Howlett, J. Multiple traversal of cyclotron targets, 7946. Multiple traversal of cyclotron targets: an extension to the theory, 9532

Cassels, J. M., Randle, T. C., Pickavance, T. G. and Taylor, A. E. The production of neutrons by high energy protons, 5743

Cassels, J. M., Stafford, G. H. and Pickavance, T. G. Proton-proton scattering at 146 MeV, 9537

Cassidy, J. M. *See* Bell, P. R., 6412

Cassignol, C. and Nief, G. On the ion optics of mass spectrometers with simple magnetic deflection, 4449

Castagnoli, C. *See* Amaldi, E., 463, 1910; Baroni, G., 1555

Castaing, R. A method of detection and measurement of elliptical astigmatism, 929. The detection and direct measurement of the axial astigmatism [astigmatisme d'ellipticité] of an electron lens, 2742

Castaing, R. and Guinier, A. A method of micro crystal analysis, 7387

Castellan, G. W. and Seitz, F. Semi-conducting materials. On the energy states of impurities in silicon, 7857

Castle, J. G., Jr. *See also* Beringer, R., 2534

Castle, J. G., Jr and Beringer, R. Microwave magnetic resonance absorption in nitrogen dioxide, 1182

Castoldi, L. On the uncertainty relation, 2395. Some geometrical characteristics of classical Rutherford scattering, 9536

Castro, H. de. *See* de Castro, H.

Caswell, D. A. *See* Becker, G. E., 7005

Catala, J. and Gibson, W. M. Range-energy relation for protons and alpha-particles in photographic emulsions for nuclear research, 6270

Català de Alemany, J. *See* Gibson, W. M., 4716, 9538

Catalán, M. A. and García Riquelme, O. E. Measurements of Zeeman effect in the Mn I spectrum, 9367

Catalán, M. A. and Velasco, R. Changes in *g*-values, in a spectrum, for different magnetic fields, 1721. Variations of the factor "*g*" in the partial Paschen–Back effect, 3711

Cauchois, Y. Observations on the *K*-emission discontinuities of Al and Mg in dilute alloys, 1085. X-ray spectrochemistry with bent crystals, 4411. Some examples of applications of bent-crystal spectroscopy, 4412. Recent developments in bent-crystal technique, 4419. *See also* Johansson, S., 5701

Cavallo, L. *See* Seliger, H. H., 9648

Cavanagh, P. E. The application of proportional scintillation γ-ray counters to the determination of the decay scheme of Au^{198}, 7211. Spectroscopy of beta- and gamma-rays, 9668. *See also* Turner, J. F., 7210

Cavanagh, P. E., Turner, J. F., Booker, D. V. and Dunster, H. J. An investigation of the secondary electron spectrum of ^{198}Au, 2985

Cave, L., Corner, J. and Liston, R. H. A. The scattering of gamma-rays in extended media. I. Perpendicular incidence on a plane slab, 2025

Cave, W. T. and Thompson, H. W. The ultra-violet absorption spectra of fluorinated toluenes, 7755

Cayrel, R. Contribution to the study of radiative equilibrium (influence of the convective zone), 6710

Cazin, M. On systems which admit a quadratic first integral other than the energy, 4115

Ceccarelli, M., Quareni, G. and Rostagni, A. On the radioactivity of potassium, 2944, 3722

Cecchini, G. The variations of latitudes and the movement of the terrestrial pole of rotation, 2353

Cech, R. E. A high-low temperature microscope stage, 245

Cennamo, F. Diffraction of X-rays by mixtures of ethyl alcohol and benzene, 4786. Diffraction of X-rays by benzene and variation with temperature, 8251

Cerny, C. *See* Lintner, K., 4728

Chabbal, R. *See* Barchewitz, P., 9372

Chackett, K. F. K^{40} and the age of the atmosphere, 5936

Chackett, K. F., Paneth, F. A., Reasbeck, P. and Wiborg, B. S. Variations in the chemical composition of stratosphere air, 9846

Chadwick, J. *See* Baddeley, G., 4822

Chaffee, E. L. *See* Yeh, C., 383

Chaghtai, M. S. B. Note on the electron velocity distribution in low voltage arcs, 344

Chakhmakhsazyan, E. A. The influence of the stressed state of a wire on its electrical resistance, 6229

Chakrabarty, S. K. "Sudden commencements" in geomagnetic field variations, 3222

Chaléat, R. The deformation of elastic wires under their own weight, 3821

Chalin, C. Periodic oscillations obtained during the anodic dissolution of silver, 9771

Challansonnet, J. *See* Debiesse, J., 3599, 7986

Chalmers, A. J. The origin of the electric charge on rain, 9862

Chalmers, B. *See also* Aust, K. T., 2077; Clark, R., 1484; Gow, K. V., 9804; Martius, U. M., 5560; Stewart, M. T., 8240

Chalmers, B. (Ed.). Progress in metal physics. II, 7439

Chalmers, B. and Martius, U. M. Dislocations in real crystals, 6564

Chalmers, J. A. *See* Hutchinson, W. C. A., 3997

Chalonge, D. *See also* Berger, J., 1590, 6706, 7494

Chalonge, D. and Divan, L. Contours of the Balmer lines and the surface temperature of a star, 48

Chalonge, D., Divan, L. and Kourganoff, V. Brightness temperature and opacity of stellar atmosphere: application to the sun, 4060

Chalvet, O. and Daudel, R. Theoretical study of the molecule of nitrogen tetroxide N_2O_4, 1962

Chalvet, O. and Roux, M. On the choice of constants in the definition of free valence on the basis of Penney bond orders, 8086

Chamberlain, O., Segrè, E. and Wiegand, C. E. Experiments on elastic *p–p* scattering in the energy range 120 to 345 MeV, 4450. Experiments on proton-proton scattering from 120 to 345 MeV, 8786

Chambers, F. W. A device for maintaining a constant potential for electro-chemical work, 1430

Champeix, R. An ionization pump, 3393. Considerations on the transformation of heat into electrical energy in thermionic phenomena, 6290

Champion, F. C. *See* Jolly, J. D., 2992

Champion, K. S. W. The production of pulsed magnetic fields using condenser energy storage, 1173

Chance, B. Rapid and sensitive spectrophotometry. I. The accelerated and stopped-flow methods for the measurement of the reaction kinetics and spectra of unstable compounds in the visible region of the spectrum, 9053; III. A double beam apparatus, 9055

Chance, B. and Legallais, V. Rapid and sensitive spectrophotometry. II. A stopped flow attachment for a stabilized quartz spectrophotometer, 9054

Chandrasekhar, B. S. *See also* Bowers, R., 2626

Chandrasekhar, B. S. and Mendelssohn, K. Subcritical flow in the helium II film, 6930

Chandrasekhar, S. The decay of axisymmetric turbulence, 133. The invariant theory of isotropic turbulence in magneto-hydrodynamics. I, 1646; II, 6774. The angular distribution of the radiation at the interface of two adjoining media, 3799

Chandrasekhar, S. and Elbert, D. Polarization of the sunlit sky, 2222

Chandrasekhar, S. and Münch, G. The theory of the fluctuations in brightness of the Milky Way. I, 2344; II, 2345; III, 8471. On stellar statistics, 3287

Chandrasekharan, K. S., Gokhale, G. S. and Rao, A. S. High altitude intensity of penetrating cosmic rays at Poona 9° N. (mag.), 1162

Chandrasekharan, V. Raman spectrum of cadium tungstate, 977. Thermal scattering of light in birefringent crystals, 5329. *See also* Krishnan, R. S., 238; Ramachandran, G. N., 6153; Ramaseshan, S., 8864

Chang, C.-H. *See also* King, S.-H., 4594

Chang, C.-H. and Peng, H. W. On the binding energies of the atomic nuclei. III, 4595

Chang, G. S. Sodium bands in the ultra-violet, $\lambda\lambda$3100–2750, 6130

Chang, L.-C. Coefficients of thermal expansion of Au–Cd alloys containing 47·5 atomic percent Cd, 4332

Chang, S.-C. *See* Spurr, R. A., 5647

Chang, S.-H. Portrayal of some elementary statistics of speech sound, 2485

Chang, S.-H., Pihl, G. E. and Essigmann, M. W. Representations of speech sounds and some of their statistical properties, 3419

Chanu, J., Guillemot, É., Lenoble, J. and Tendron, G. Filters isolating the 3125 and 2537Å lines of mercury for the photographic study of documents, 7688

Chao, C. Y. The angular distributions of the alpha-particles and of the gamma-rays from the disintegration of fluorine by protons, 3000

Chapelle, J. *See also* Lutz, A., 2157

Chapelle, J. and Galy, A. On the Raleigh diffusion of crystals, 1774

Chapman, A. H. *See* Armenteros, R., 6297

Chapman, P. R. *See* Griffith, R. H., 1399

Chapman, R. M. *See* Shaw, J. H., 814, 5034

Chapman, S. Upper atmospheric nomenclature, 1534, 2201, 3974. Corpuscular influences upon the upper atmosphere, 2204. Notes on aurorae and magnetic storms. I. Consideration as to a model experiment 3998. The theory of magnetic storms and auroras, 8372. The normality of geomagnetic disturbance at Huancayo, 9185

Charakhchyan, A. N. *See* Vernov, S. N., 427, 1899

Chari, S. S. *See* Parthasarathy, S., 1675

Charlton, T. M. Some notes on the analysis of redundant systems by means of the conception of conservation of energy, 2401

Charnock, H. "Atmospheric turbulence" (disc.), 4929

Charpak, G. *See also* Suzor, F., 4443

Charpak, G. and Suzor, F. Angular correlation of the two photons emitted in cascade by the nuclide $^{24}_{12}$Mg, 2979. On the possibility of the emission of a particle having the charge of the electron, yet distinct from it, in β^+ and β^- radioactivity, 3734. On the absorption and back scattering of electrons and of β-radiation, 3735. On the back scattering of electrons, 7940

Charpie, R. A. *See* Sun, K.-H., 6457*
Charpurey, K. G. *See* Brú, L., 5930*
Charron, E. and Ségard, N. Interference of the two beams emerging from a Lummer–Gehrcke interferometer, 8658
Charron, F. Friction and viscosity in plastic bodies, 1372
Chase, C. E. *See* Atkins, K. R., 9431
Chasmar, R. P., Craston, J. L., Isaacs, G. and Young, A. S. A method of sealing sapphire to glass and its application to infra-red photocells, 6910
Chasmar, R. P. and Gibson, A. F. The characteristics of long period photo-effects in lead sulphide, 7894*
Chasmar, R. P. and Putley, E. H. Semi-conducting materials. Measurement of the temperature dependence of conductivity and hall coefficient in lead sulphide and lead telluride, 7870
Chasson, R. L. *See* MacKnight, M. L., 9548
Chatelain, P. P. Theoretical study of light scattering by a fluid having one isotropic axis, application to nematic-type liquid crystals, 8663
Chatelet, J. and Cabarat, R. On the elastic properties of sodium chloride, 8258
Chatterjee, A. On the X-ray luminescence spectra of alkali halides, 222. On the X-ray luminescence spectra of thallium-activated alkali halide crystals, 3458
Chatterjee, S. *See also* Nag, B. D., 394,* 6407
Chatterjee, S. and Dhar, S. Scintillation type alpha counter and its application in U and Th estimation of minerals, 3587
Chatterjee, S. D. Evidence of long-range secondary electrons accompanying cosmic rays in a proportional counter, 6298. *See also* Ensell, G., 9547
Chatterji, P. P. *See* Kar, K. C., 3343
Chaudet, J. H. *See* Dawson, L. R., 6864
Chaudhari, K. R. An optical extensometer, 3086
Chaudhary, P. K. S. On the existence of Rossi second and third maxima, 4501
Chaudhuri, N. K. *See* Ganguly, S. C., 5297
Chaudhury, M. L. *See* Kar, K. C., 6422
Chaudron, G. *See* Berghezan, A., 1351; Duflot, J., 1486; Michel, A., 6334
Chauvin, H. and Leach, S. On the emission spectra of ammonia and heavy ammonia excited by electron impact, 2518
Chavasse, P. and Lehmann, R. Note on the definition of complex noise having a continuous spectrum [white noise], 2487. The watch, standard sound source for the measurement of auditory sensitivity, 4011
Chedester, C., Isaacs, P., Sachs, A. and Steinberger, J. Total cross sections of π-mesons on protons and several other nuclei, 7288
Chemla, M. Diffusion of P^{32} and of S^{35} in sodium chloride, 6490. Coefficients of thermal diffusion of P^{32} and of S^{35} in sodium chloride, 8241
Chemla, M. and Süe, P. New method of preparing carrier-free artificial radio elements. Case of S^{35}, 9681
Chen, J. J. L. *See* Van Atta, C. M., 3562; Warshaw, S. D., 1107, 2011
Cheney, M. G., Jr and Watson, R. B. On the diffraction of electromagnetic waves by two conducting parallel half-planes, 5605
Cheng, K. C. *See* Green, H. S., 6026
Cheng, L. M. Energy transfer by collision in benzene vapor, 6078
Chernikova, L. A. Investigation of the ideal magnetization curves of soft polycrystalline ferromagnetics, 7106
Chernysheva, M. A. Mechanical twinning in crystals of Rochelle salt, 3191
Cherry, L. T. *See* Purbrick, R. L., 7965
Cherry, T. M. Exact solutions for flow of a perfect gas in a two-dimensional Laval nozzle, 135
Chesterman, W. D. The photographic study of rapid events, 7443
Chesterman, W. D., Clegg, D. R., Peck, G. T. and Meadowcroft, A. J. A new power stroboscope for high-speed flash photography, 4026, 9904
Chesterman, W. D. and Myers, D. T. A 35 mm high-speed cinematograph camera, 9905
Cheston, W. B. On the reactions $\pi^+ + d \rightleftarrows p + p$, 8995
Chetaev, D. N. On sound emission by means of a piston, 6806
Chevallier, A. Note on the predetermination of the conditions of propagation of a high-frequency wave along a 3-phase symmetrical line connected between a conductor and earth, and whose other two terminals are loaded with equal impedances, 5600
Chevallier, R. Magnetic properties of rhombohedral ferric oxide, α Fe_2O_3, 6333
Chevet, A. *See* Rohmer, R., 953
Chew, G. F. The inelastic scattering of high energy neutrons by deuterons according to the impulse approximation, 1332. *See also* Moyer, B. J., 4687
Chew, G. F. and Moyer, B. J. High energy nucleon-nucleon scattering experiments at Berkeley, 4699
Cheydleur, B. F. *See* Oldham, M. S., 987
Chhaya, B. N. *See* Prasad, M., 1442
Chiang, R. S. H. *See* Goldhaber, S., 8305
Chiarotti, G. and Giulotto, L. Amplitude measurements of nuclear signals, 9642
Chien, W.-Z. Symmetrical conical flow at supersonic speed [studied] by the perturbation method, 2447
Chikazumi, S. Ferromagnetic properties and superlattice formation of iron-nickel alloys, I, 1927; II, 1928
Childe, V. G. Comparison of archaeological and radiocarbon datings, 2194
Childs, W. J. *See* Cork, J. M., 2017, 4647, 4677, 5708, 8926, 8943, 9672
Chiozzotto, M. Apparatus for automatic pressure control in a high-vacuum system, 7609. Device for automatic pressure control in a high-vacuum plant, 9330. *See also* Ageno, M., 212
Chiplonkar, V. T. A note on the effect of the photoelectric emission from the electrodes on the rectifying action of a discharge, 9503
Chipman, D. R. *See* Lazarus, D., 4878
Chipman, J. *See* Elliott, J. F., 4356
Chisholm, J. S. R. Calculation of matrix elements, 5091
Choate, R. L. and Lund, L. H. Note on surface tension and the theory of holes, 8557
Chormonov, T. Kh. *See* Konstantinova, V. P., 2668
Chou, S. *See* Kohl, D., 9551
Choudhury, A. On the absorption of u.h.f. radio waves by opalescent binary liquid mixtures, 5615
Choudhury, D. C. Effect of vertical transport of ions caused by solar tides in *F*-2 region, 8376
Chovin, P. *See* Moureu, H., 3864, 4844
Chowdhury, D. C. *See* Majumdar, S. D., 1985
Chrelashvili, A. G. *See* Skanavi, G. I., 6205
Chrétien, A. and Davion, M. Experimental verification of the theory of diffusion by liquid current in the physical solution of salts, 7601
Christ, C. L. X-ray crystallography of cyanamide H_2NCN, 3212
Christensen, C. J. *See* Howell, B., 9826
Christian, D. and Martin, D. S., Jr. Preparation of Co^{58m} by a (γ, n) reaction, 3023
Christian, J. W. A theory of the transformation in pure cobalt, 3908
Christiansen, J. A. The mechanism of bimolecular reactions in solutions, 9765
Christiansen, W. N. and Hindman, J. V. A long-period change in radio-frequency radiation from the "quiet" sun at decimetre wave-lengths, 5990
Christiansen, W. N., Hindman, J. V., Little, A. G., Payne-Scott, R., Yabsley, D. E. and Allen, C. W. Radio observations of two large solar disturbances, 5026
Christiansen, W. N., Yabsley, D. E. and Mills, B. Y. Measurements of solar radiation at a wavelength of 50 centimetres during the eclipse of November 1, 1948, 803
Christie, R. W. and Lawson, A. W. High temperature specific heat of AgBr, 4350
Christoph, P. Suspension strip, 5135
Christopherson, D. G. Hydrodynamic lubrication: general survey, 3363
Chu, C.-C. *See* Clark, G. L., 9176
Chu, T. C. New radioactive isotopes of iridium, 566
Churchman, A. T. and Cottrell, A. H. Yield phenomenon and twinning in α-iron, 7321
Chynoweth, A. G. Behaviour of space charge in diamond crystal counters under illumination. I, 7032. Behaviour of space charge free diamond crystal counters under beta-ray bombardment. II, 7033

Cialdea, R. The spectral distribution of polarization in sky light, 2221

Cicala, P. Plastic deformation, 1369. On the critical load of a disk compressed beyond the elastic limit, 2093

Cini, M. Some variational-principle relationships connected with the Feynman and Schwinger formulations of electrodynamics, 2384

Cini, M. and Radicati, L. A. A variational principle for time-dependent problems, 1623, 2383. On the scattering of mesons by nucleons, 7556. On the double scattering of mesons by nucleons, 8990

Cirilli, V. and Burdese, A. On dicalcium ferrite and ternary solid solutions of the ferric calcium-alumina-oxide system, 9153

Citron, A. Barometer effect and daily variation of large air showers, 8822

Claassen, H. H. *See* Nielsen, J. R., 2544; Shaw, J. H., 4919, 5995

Claassen, R. S., Brown, R. J. S., Freier, G. D. and Stratton, W. R. The scattering of protons by tritons, 5481

Clapp, C. W. and Bernstein, S. Thickness gaging by radiation absorption methods, 2403

Clarebrough, L. M. Deformation and recrystallization of alloys containing two phases, 1367

Clarebrough, L. M. and Nicholas, J. F. The superstructure in the α phase of silver-magnesium alloys, 1355

Clarence, N. D. and Malan, D. J. Magnetic-tape recording of electrostatic field changes, 7421

Clark, A. M. and Din, F. Equilibria between solid, liquid and gaseous phases at low temperatures. The binary systems, acetylene carbon dioxide, acetylene ethylene and acetylene ethane, 3111

Clark, A. R. and Mungal, A. G. Scale model experiments in electromagnetic methods of geophysical exploration, 8850

Clark, D. *See* Brown, J. F., 6500

Clark, D. L., Roberts, A. and Wilson, R. Cross section for the reaction $\pi^+ + d \rightarrow p + p$ and the spin of the π^+ meson, 8224

Clark, G. L. and Chu, C.-C. X-ray diffraction study of several branched-chain fatty acids, 9176

Clark, H. L. Sun follower for V-2 rockets, 793

Clark, J. A. *See* Rohsenow, W. M., 7805

Clark, J. W. and Neubert, R. E. End-cooling of power-tube filaments, 406

Clark, L. M. *See* Brooks, R., 1488

Clark, O. H. and Deutsch, M. L. Scheme for analyzing capillary measurements on non-Newtonian liquids, 110

Clark, O. H., Woods, W. W. and White, J. R. Lubrication at extreme pressures with mineral oil films, 4141

Clark, R., Craig, G. B. and Chalmers, B. Mechanical twinning in white tin, 1484

Clark, R. A. and Reissner, E. Deformations and stresses in Bourdon tubes, 1365

Clark, R. K. Absolute determination of the emission rate of beta-rays, 593

Clarke, J. T. *See* Kerr, E. C., 3485

Clarke, L. N. and Kingston, R. S. T. Equipment for the simultaneous determination of thermal conductivity and diffusivity of insulating materials using a variable-state method, 2597

Clarke, S. G. and King, A. J. Preliminary study of the structure of citrinin, 3945

Class, C. M. *See also* Gelinas, R. W., 9700

Class, C. M. and Hanna, S. S. The lithium-7 nucleus, 9699

Clastre, J. Increase of contrast in the Patterson function, 8353

Claussen, W. F. Suggested structures of water in inert gas hydrates, 5907

Claussnitzer, W. and Heumann, H. Mapping electric fields with the help of semi-conducting sheets, 2655

Clay, A. *See* Bradford, R., 8109

Clay, J. The radiation complex of extensive air showers, 418. The qualitative similarity of origin of the main cosmic radiation and of showers, 4498. Similarity of initial processes of continuous cosmic radiation and showers. I–II, 8821

Clay, J., Dijker, A. J. and Jongen, H. F. Solar flares and the origin of cosmic radiation, 417

Clay, J. and Jongen, H. F. The solar flare of November 19, 1949 and cosmic rays, 460

Clay, J. and van Alphen, E. The energy spectrum of the soft (electron) part of cosmic radiation found by absorption in Pb and Al, 8819

Clay, J. and van der Maesen, F. Conductivity of liquids and the influence of mixing on dissociation, 3135

Clayton, D. An introduction to boundary and extreme pressure lubrication, 3835

Clayton, D. and Jenkins, C. H. M. Physical changes in rubbing surfaces on scuffing, 3841

Clayton, H. H. The scattering of neutrons by bound protons and crystals, 9727

Clayton, H. R. and Young, R. S. Improvements in the design of ultrasonic lamination detection equipment, 5209

Cleary, E. P. *See* Cobine, J. D., 1071

Clegg, D. R. *See* Chesterman, W. D., 9904

Clegg, J. A. *See* Aspinall, A., 5989

Clegg, J. A. and Closs, R. L. Plasma oscillations in meteor trails, 8449

Cleland, J. W., Crawford, J. H., Jr, Lark-Horovitz, K., Pigg, J. C. and Young, F. W., Jr. The effect of fast neutron bombardment on the electrical properties of germanium, 6969

Clemence, G. M. On revising the official system of astronomical constants, 1569

Clement, J. *See* Jensen, E. N., 3736

Clement, J. R. and Quinnell, E. H. Atomic heat of indium at liquid helium temperatures, 1021

Clementel, E. Scattering of neutrons by deuterons, 3798. *See also* Bassi, P., 474

Clemmow, P. C. A method for the exact solution of a class of two-dimensional diffraction problems, 2581

Clendenin, W. W. *See* Luke, P. J., 8903; Meyerott, R. E., 8534

Cleveland, F. F. *See also* Decker, C. E., 6375; El-Sabban, M. Z., 7735; Klein, M. J., 8099; Madigan, J. R., 4262; Voelz, F. I., 8881

Cleveland, F. F., Lamport, J. E. and Mitchell, R. W. Substituted ethanes. II. Raman and infra-red spectra of 2,3-dibromo and 2,3-dimethyl-butane and 2,2,3,3-tetramethylbutane, 957

Cleveland, F. F. and Porcelli, P. Raman spectra of hydrocarbons. V. *n*-hexane, *n*-heptane, 2-methylpentane, 3-methylpentane, 2,4-dimethylpentane, and 2,3-dimethylbutane, 2568

Clews, C. J. B. An X-ray examination of uranium-iron alloys, 774. *See also* Calnan, E. A., 1373, 9030, 9752

Click, C. C. Luminescence of colour centres in alkali halides, 732

Clifford, J. *See* Tochilin, E., 361

Closs, R. L. *See* Clegg, J. A., 8449

Clotfelter, B. E. *See* Fowler, R. G., 6992

Cloud, R. W. *See also* Trump, J. G., 1083

Cloud, R. W. and Philp, S. F. Vacuum tests of rubber, lead, and Teflon gaskets and vinyl acetate joints, 129

Clouston, J. G. *See* Guest, P. G., 2577

Clusius, K. and Meyer, H. Deposition images of gas flow caused by thermal diffusion, 9327

Cobble, J. W. and Atteberry, R. W. The precision determination of some half-lives, 2955

Cobine, J. D., Cleary, E. P. and Gray, W. C. A microwave study of the high pressure arc, 1071

Cobine, J. D. and Wilbur, D. A. The electronic torch and related high frequency phenomena, 6239

Coburn, N. Compressible supersonic flow in jets under the Kármán–Tsien pressure-volume relation, 2449

Cocconi, G. Extensive air showers and total cosmic radiation, 1155. On the origin of the cosmic radiation, 8812

Cocconi, G. and Cocconi Tongiorgi, V. Intensity and lateral distribution of the *N*-component in the extensive showers of the cosmic radiation, 433. Nuclear disintegrations induced by μ-mesons, 9685

Cocconi, G., Cocconi Tongiorgi, V. and Widgoff, M. Cascades of nuclear disintegrations induced by the cosmic radiation, 464

Cocconi Tongiorgi, V. *See* Cocconi, G., 433, 464, 9685

Cochet-Muchy, B. and Paris, R. A. Evolution of the transformation of a pure substance in solid solutions and in double salts, 8320

Cochran, R. G. *See* Schelberg, A. D., 2039

Cochran, W. The structures of pyrimidines and purines. V. The electron distribution in adenine hydrochloride, 3938. Some properties of the (F_O-F_C)-synthesis, 9139. The crystal structure of salicylic acid, 9166

Cockbain, E. G. and McMullen, A. I. Adsorbed films at oil-water interfaces, 9083

Cockcroft, A. L. and Curran, S. C. The elimination of the end effects in counters, 4459

Cockroft, A. L. and Valentine, J. M. The properties of proportional tubes and ion chambers with glass envelopes and external graphite electrodes, 386

Codrington, R. S. *See* Holroyd, L. V., 6550

Coekelbergs, R. *See* Mund, W., 6172

Coester, F. On the evaluation of the *S*-matrix, 4103; Erratum, 8523. Quantum electrodynamics with nonvarnishing photon mass, 7525

Coffer, H. F. *See* Vold, R. D., 4788

Coffin, L. R., Jr. The flow and fracture of a brittle material, 676

Coggeshall, N. D. and Pozefsky, A. Solvent induced frequency shifts for cata-condensed aromatics, 7738

Cohen, B. L. Theory of natural alpha-radioactivity, 1279. $(n, 2n)$ and (n, p) cross sections, 3781. Angular distribution of neutrons from (α, n) and (d, n) reactions, 4694. High-energy neutron threshold detectors, 6482

Cohen, E. R. Nonindependent observational equations in the theory of least squares, 3309. *See also* DuMond, J. W. M., 5061

Cohen, G. and Kuczynski, G. C. Coefficient of self-diffusion of copper, 1343

Cohen, R. S., Spitzer, L., Jr and Routly, P. McR. The electrical conductivity of an ionized gas, 1059

Cohen, S. G. Evidence for the natural radioactivity of indium, 6416

Cohen, S. T. *See* Plesset, M. S., 3746

Cohen, V. W. *See* Wentink, T., Jr, 5677

Cohen-Solal, L. Role played by certain dyes in the action of infra-red on the latent image (Herschel effect), 2274

Cohn, H. O. *See* Thompson, R. W., 7992

Cohn, S. B. The electric and magnetic constants of metallic delay media containing obstacles of arbitrary shape and thickness, 5610

Cojan, J.-L. Study of the variation of the factor of reflection of mercury vapor as a function of the pressure for two of the hyperfine components of the resonance ray $\lambda = 2537$, 182. *See also* Lennuier, R., 2515

Colacevich, A. On a possible deviation of light through the Pleiades nebula, 5038

Colburn, C. B. *See* Eyring, H., 1416

Colby, M. Y. *See* Newton, C. J., 8684

Coldren, C. L. *See* Alexander, L. G., 9076

Cole, H. Magneto-optic effects in glass. I. Some preliminary observations on the application of magneto-optic properties to structural considerations, 4561

Cole, H. J. D. The theoretical behaviour of a magnetic monopole in a Wilson cloud chamber, 2064

Cole, J. F. I. *See* Richards, E. W. T., 3462

Cole, J. O. *See* Field, J. E., 949

Cole, R. Optimum optical density in spectrophotometry, 4232 *See also* Robinson, D. Z., 8620

Cole, R. H. *See* Davidson, D. W., 1819, 9449

Cole, W. A. *See* Beeck, O., 1449

Cole, W. F., Sörum, H. and Taylor, W. H. The structures of the plagioclase felspars, I, 2183

Coleman, H. S., Coleman, M. F. and Fridge, D. L. Theory and use of the dioptometer, 4325

Coleman, J. J. Distribution of current in porous electrodes, 3143

Coleman, J. S. *See* Lindner, M., 5699

Coleman, M. F. *See* Coleman, H. S., 4325

Coles, D. K. *See also* Lide, D. R., 2526

Coles, D. K., Good, W. E., Bragg, J. K. and Sharbaugh, A. H. The Stark effect of the ammonia inversion spectrum, 6869

Colgate, S. A. Addition of specified elements to liquid counters, 6281. The positron activity of K^{40}, 6411. The photodisintegration cross-section of the deuteron, 9705

Colichman, E. L. Determination and significance of polarographic critical micelle concentrations, 1465

Colin, M. and Phillips, S. E. Dielectric properties of HCl and DCl in solid state, 6946

Collet, L.-H. Research on electrical osmosis, 331. The possibilities of extracting the hydrogen ion from electrolytic solutions, 9768. *See also* Rollet, D., 6536

Collett, C. T., Hughes, J. C. and Morey, F. C. Measurement of the internal diameters of metallic capillary tubes, 2402

Colli, L., Facchini, U. and Gatti, E. Pulses in argon counters, 1879

Collie, C. H. *See* Bishop, G. R., 1307, 4723, 4761; Wilson, R., 388

Collin, R. L. The crystal structure of bandylite, $CuCl_2 \cdot CuB_2O_4 \cdot 4H_2O$, 6594. *See also* Abrahams, S. C., 2176

Collin, R. L. and Lipscomb, W. N. The crystal structure of hydrazine, 2175

Collinge, B. and Robbins, E. J. Alpha-particle scintillations in organic compounds, 2573

Collins, B. G. *See* Pratt, A. W., 2195, 9191

Collins, C. B., Freeman, J. R. and Wilson, J. T. A modification of the isotopic method for the determination of geological ages, 7400

Collins, E. R., McKenzie, C. D. and Ramm, C. A. *Q*-Values of the (p, α) reactions in lithium-6, lithium-7 and nitrogen-15, and the Bp values of thorium C′ and polonium alpha-particles, 6453

Collins, F. C. Diffusion in chemical reaction processes and in the growth of colloid particles, 4854

Collins, J. R. *See* Bamford, C. H., 2120–1

Collins, S. and Bryce, W. A. Chemical reactions in a magnetic field, 1210

Collins, T. L. Nuclear magnetic resonance for K^{39}, 1246

Colmer, F. C. W. and Littler, D. J. Pile neutron absorption cross-section of some of the elements, 652. Gleep: design, construction and use, 4744

Colombani, A. The calculation of currents induced in a solid sphere. Self-induction and mutual induction with an infinite solenoid, 1195. Heating of a hollow metal sphere by induction, 3649

Colombani, A. and Ranc, G. On the crystallization of very thin Au-films, 5901. The influence of the substrate on the crystallization of very thin Au films, 8339

Colombino, P. Input multivibrator of high resolving power for coincidences, 2772

Colombo, S. On a general treatment of problems in cybernetics, 5003

Colonnetti, G. The practical value of a theory of elasto-plastic equilibrium, 4802

Colthup, N. B. and Torley, R. E. A simple surface tensiometer, 7595

Combes, L. S., Ballard, S. S. and McCarthy, K. A. Mechanical and thermal properties of certain crystalline materials, 4229

Combridge, J. H. and Ackroyd, J. O. Upper limit of frequency for human hearing, 6661

Comstock, A. A. and Rollefson, G. K. The reactions of radicals produced by the action of sodium on alkyl iodides, 4820

Condon, F. E., McMurry, H. L. and Thornton, V. Infrared and mass spectra of some deuterium-containing derivatives of propane, 7710

Conforto, A. M. *See* Sard, R. D., 8012

Conjeaud, M. and Naggiar, V. The energy of α-particles from Pu^{239}, 3732

Conn, E. E. *See* Brosi, A. R., 4645

Conn, G. K. T. and Donovan, B. A simple means of measuring large magnetic fields, 2819

Conn, W. M. The use of "exploding wires" as a light source of very high intensity and short duration, 6917

Connell, L. F., Jr and Martin, H. C., Jr. Concerning reported discrepancies between X-ray macroscopic measurements of thermal expansion of some alkali halides, 2605

Connor, R. D. The properties of spark counters of the Rosenblum type, 2768

Conversi, M. A portable pulse generator for the analysis of coincidence circuits, 396. Excess of positive mesons at 9.15 km above sea level, 443.

Altitude dependence and latitude dependence at 9145 m. of penetrating particles slowed down after traversing 15 cm of lead, 444. Experiments on cosmic-ray mesons and protons at several altitudes and latitudes, 456
Conversi, M. and Ticho, H. K. An apparatus for the study of meson production in the stratosphere, 479
Conway, B. E., Bockris, J. O'M. and Ammar, I. A. The dielectric constant of the solution in the diffuse and Helmholtz double layers at a charged interface in aqueous solution, 9067
Cook, A. C., Kirchmayer, L. K. and Weygandt, C. N. Special devices aid differential analyzer solution of complex problems, 3620, 5977
Cook, A. H. The calculation of deflexions of the vertical from gravity anomalies, 1592. A note on the errors involved in the calculation of elevations of the geoid, 8484
Cook, C. S. The capture of orbital electrons by nuclei (*K*-capture), 4633. On the *K*-capture/positron branching ratio for Cu^{61}, 8918. *See also* Porter, F. T., 4662; Ter-pogossian, M., 1662, 1997, 4643, 7232
Cook, C. S. and Owen, G. E. The allowed beta-spectrum, 2014
Cook, D. and Longuet-Higgins, H. C. Application of the theory of conformal solutions to the system carbon dioxide-ethylene, 9322
Cook, D. B. *See also* Dash, J. G., 2620
Cook, D. B., Zemansky, M. W. and Boorse, H. A. Superconductivity of columbium nitride, 1065. The superconductivity of columbium, 1849
Cook, G. B., Duncan, J. F. and Hewitt, M. A. Geometrical efficiencies of end-window G-M counters, 4461
Cook, H. F. The dielectric behaviour of water in water-dioxan mixtures, 8719. The dielectric behaviour of some types of human tissues at microwave frequencies, 9878. Dielectric behaviour of human blood at microwave frequencies, 9879
Cook, J. R. *See* Tait, J. F., 2265
Cook, K. L. Quantitative interpretation of vertical magnetic anomalies over veins, 1525
Cook, K. M. *See* Brown, J. H. U., 4978
Cook, L. J. *See* Bishop, A. S., 2060
Cook, M. and Richards, T. L. Fundamental aspects of the cold working of metals, 3829
Cook, M. A., Eyring, H. and Thomas, R. N. The physical theory of meteors. I. A reaction-rate approach to the rate of mass loss in meteors, 6683
Cook, M. A., Pack, D. H. and Oblad, A. G. Structural model of low pressure "physical" absorption, 4860
Cook, R. K. and Weissler, P. G. Piezoelectric constants of alpha- and beta-quartz at various temperatures, 1823
Cooke, A. H. Paramagnetic relaxation effects, 497. *See also* Benzie, R. J., 1930, 2838, 9603
Cooke, E. L. and Hackerman, N. Adsorption of polar organic compounds on steel, 9084
Cooke, W. D. *See* Reilley, C. N., 9112
Cooke-Yarborough, E. H. and Pulsford, E. W. A counting rate meter of high accuracy, 4475
Coolidge, J. E. and Schulze, G. Note on static electrification of dust particles on dispersion into a cloud, 2656
Coomes, E. A. *See* Finn, G. B., 4489; Munick, R. J., 2776
Coon, J. H. Disintegration of He^3 by fast neutrons, 2051. *See also* Brolley, J. E., Jr, 4742
Coon, J. H., Bockelman, C. K. and Barschall, H. H. Angular distribution of 14-Mev neutrons scattered by tritons, 3037
Cooper, B. F. A balloon-borne instrument for telemetering raindrop-size distribution and rainwater content of cloud, 8374
Cooper, C. V. and Stroupe, J. D. Wavelength calibration in the infrared by interference, 6898
Cooper, D. H. *See* Brolley, J. E., Jr, 8917
Cooper, F. S. Spectrum analysis, 1698
Cooper, F. S., Liberman, A. M. and Borst, J. M. The interconversion of audible and visible patterns as a basis for research in the perception of speech, 7645
Cooper, J. L. B. The characterization of quantum-mechanical operators, 3. The paradox of separated systems in quantum theory, 832
Cooper, J. N. *See* Grove, G. R., 1304, 5749
Cooper, R. The mechanism of breakdown of air at ultra high frequencies, 3537
Cooper, R. I. B. Variations in the length of the day, 4068
Cooper, R. I. B. and Longuet-Higgins, M. S. An experimental study of the pressure variations in standing water waves, 5152
Cooper, W. C. *See* Furman, N. H., 3180
Cooperstein, M. *See* George, D. E., 7001
Coor, T., Jr. Ionization chamber bursts at high altitudes, 5545
Copeland, P. L. and Eggenberger, D. N. The electric field at a thermionic cathode as a function of space current, 1893
Coppens, R. On the use of photographic "nuclear research" emulsions for the microradiographic examination of rocks and the study of radioactive inclusions, 4632
Copson, E. T. The expansion of a gas cloud into a vacuum, 2315
Corak, W. S. *See* Wexler, A., 320
Cordero, F. *See* Dibeler, V. H., 3355
Corinaldesi, E. On the electromagnetic properties of mesons, 1615. On the influence of the particle structure in the Møller scattering of μ-mesons on protons, 3789. Charge fluctuations in quantum electrodynamics, 9267
Corinaldesi, E. and Papapetrou, A. Spinning test-particles in general relativity. II, 9260
Cork, B. Energy dependence of proton-proton scattering, 18·8 to 31·8 Mev, 1875; Erratum, 5480
Cork, J. M. Nuclear energy levels for some long-lived isotypes, 3729. *See also* Keller, H. B., 1280
Cork, J. M., Branyan, C. E., Stoddard, A. E., Keller, H. B., LeBlanc, J. M. and Childs, W. J. Gamma-radiation associated with radium and daughter products, 8943
Cork, J. M., Childs, W. J., Branyan, C. E., Rutledge, W. C. and Stoddard, A. E. The high energy gamma radiation from Ta^{181}, 4677
Cork, J. M., LeBlanc, J. M., Stoddard, A. E., Childs, W. J., Branyan, C. E. and Martin, D. W. Radioactivity induced in iridium by neutron capture, 5708. The radioactivity of barium^{140}, 8926
Cork, J. M., Rutledge, W. C., Branyan, C. E., Stoddard, A. E., Childs, W. J. and LeBlanc, J. M. Gamma-rays from Ag^{110}, 2017
Cork, J. M., Rutledge, W. C., Branyan, C. E., Stoddard, A. E. and LeBlanc, J. M. Energy levels associated with Se^{75}, 577
Cork, J. M., Rutledge, W. C., Stoddard, A. E., Branyan, C. E. and Childs, W. J. The radioactive decay of I^{131}, 4647
Cork, J. M., Rutledge, W. C., Stoddard, A. E., Branyan, C. E. and LeBlanc, J. M. Radioactivity from enriched isotopes of cadmium, 573
Cork, J. M., Stoddard, A. E., LeBlanc, J. M., Branyan, C. E., Martin, D. W. and Childs, W. J. Gamma-radiation from lanthanum 140, 9672
Corliss, E. L. R. and Snyder, W. F. Calibration of audiometers, 1688
Corliss, L. *See also* Weiss, R. J., 9006
Corliss, L., Delabarre, Y. and Elliott, N. Paramagnetic susceptibilities of solid solutions of MnF$_2$ and ZnF$_2$, 495
Corner, J. *See also* Cave, L., 2025
Corner, J., Day, F. A. G. and Weir, R. E. The scattering of gamma-rays in extended media. III. Problems with spherical symmetry, 2027
Corner, J. and Liston, R. H. A. The scattering of gamma-rays in extended media. II. Back-scattering of gamma-rays from a thick slab, 2026
Corner, J. and Pendlebury, E. D. The coagulation and deposition of a stirred aerosol, 8308
Corner, W. D. *See* Tebble, R. S., 1938, 9595
Corney, G. M. Comment on nomenclature in "Electron microradiography of electrodeposited metals," 6672
Corrin, M. L. A comparison of the specific surface areas of solids as calculated by the Brunauer–Emmett–Teller and the Hüttig equations, 9786
Corrington, M. S. Transient testing of loudspeakers, 2475
Corrsin, S. On the spectrum of isotropic temperature fluctuations in an isotropic turbulence, 4170
Corruccini, R. J. *See* Shenker, H., 8746

Corson, D. R. Multiple scattering of fast electrons in nuclear emulsions, 1868. *See also* Camac, M., 6449

Corte, M. Della. *See* Della Corte, M.

Cortini, G. *See* Bernardini, G., 469–70

Corwin, J. F. and Swinnerton, A. C. The growth of quartz in alkali halide solutions, 9809

Coryell, C. D. *See* Spiegler, K. S., 7347

Cosslett, V. E. and Nixon, W. C. X-ray shadow microscope, 7930

Costa de Beauregard, O. On relativistic symmetry in the non-superquantized formalism, 2368. New definition of the hermiticity of the operator $(h/2\pi i\partial)^k$, 2388. Comparison of the spectra of the operators H_t and $(h/2\pi i)(\partial/\partial t)$, 2389. The Wheeler–Feynman theory of electromagnetic interaction, 4089. Variation of the distribution function of the four-operator $(-h/2\pi i)\partial_k$ in a transition. Equivalence between our theory and Feynmann's theory of the positron, 4116. The development of a theory of Marcel Riesz. The covariant form of the energy-momentum distribution function of a free electron, 5108. An alternative convariant formulation of the electron-positron theory, 7510

Costa Ribeiro, J. On the thermo-dielectric effect, 1821

Costain, C. C. An empirical formula for the microwave spectrum of ammonia, 5280

Cottin, M. Isotopic exchanges between cobalt and tantalum and their ions in solution, 1390. *See also* Haissinsky, M., 2425

Cotton, E. Investigations of the magnetic spectrography of α-particles of radioactive substances. Application to radiation of polonium and protactinium, 7222

Cotton, E., Tauzin, P. and Tsai, B. Apropos two papers by Ehrenhaft and Herzog. Is a uniform magnetic field capable of accelerating the radiation emitted by radium-E? 3675

Cottrell, A. H. *See also* Churchman, A. T., 7321

Cottrell, A. H. and Bilby, B. A. A mechanism for the growth of deformation twins in crystals, 7376

Cottrell, J. *See* Ames, J., 3194

Cottrell, T. L. The absorption of interrupted infra-red radiation, 3402. Molecular energy at high pressure, 8585. *See also* Orgel, L. E., 4583

Cottrell, T. L. and Paterson, S. The virial theorem in quantum mechanics, 5129. Approximate wave-function satisfying the virial theorem, 8873

Cottrell, T. L. and Reid, T. J. The thermal decomposition of nitromethane, 1394

Cottrell, T. L. and Sutton, L. E. Covalency, electrovalency and electronegativity, 6379

Cotzias, G. C. *See* Dole, V. P., 6761

Couder, A. Correction of thermal deformations of telescope mirrors, 2307

Couderc, P. *See* Danjon, A., 1583

Coulon, R. *See* Safary, E., 9374

Coulson, C. A. Bond lengths in conjugated molecules: the present position, 6380. Critical survey of the method of ionic-homopolar resonance, 7159. Some recent theories of chemical reactivity, 9767. *See also* Barnett, M. P., 3252; Burkitt, F. H., 9093

Coulson, C. A. and Baldock, G. R. On conditions for the existence of surface states, 1406

Coulson, C. A., Craig, D. P. and Jacobs, J. Electronic levels in simple conjugated systems. III. The significance of configuration interaction, 5640

Coulson, C. A., Daudel, R. and Robertson, J. M. Bond lengths in naphthalene and anthracene, 7162

Coulson, C. A. and Jacobs, J. Electronic levels in simple conjugated systems. II. Butadiene, 5639

Couper, A. and Eley, D. D. The parahydrogen conversion on palladium-gold alloys, 1421

Courant, E. D. Direct photodisintegration processes in nuclei, 5776

Courtemanche, R. *See* Demers, P., 1166

Courtney-Pratt, J. S. A discussion on detonation: a new photographic method for studying fast transient phenomena, 3129

Courtoy, C., de Hemptinne, M. and Migeotte, M. V. Infrared absorption spectrum of $H_2C = CHD$, 4275

Courty, C. The measurement of magnetic susceptibility by the Faraday method, 7060. The measurement of magnetic constants by the Faraday method, 8832. *See also* Berthier, P., 9598

Cousins, A. W. J. Magnitudes of bright stars in the E regions observed by the Fabry method, 9245

Cousins, S. W. and Ware, A. A. Pinch effect oscillations in a high current toroidal ring discharge, 3539

Couteau, P. A determination of the effective temperature of a white-dwarf showing faint H emission (lines), 4061. A relation between the positions of the white dwarfs on the Russell diagram, their hydrogen content, and their mass, 6709

Coutrez, R. Present methods of stellar dynamics as applied to problems of the Milky Way, and extragalactic nebulae, 2346

Coutts, J. R. H. and Fairbrother, J. A. V. Poisson's ratio and electrical resistance, 7319

Couture-Mathieu, L. Raman spectrum and structure of acid potassium carbonate, 984. *See also* Mathieu, L.-P., 4298, 9375

Couture-Mathieu, L. and Mathieu, J.-P. Variation of frequency of Raman lines with the direction of propagation of electric waves in the crystal, 979

Covington, A. E. Some characteristics of 10·7-centimetre solar noise. I, 5023; II, 6686

Cowan, E. W. Continuously sensitive diffusion cloud chambers, 3594

Cowan, F. P. and Nehemias, J. V. Sensitivity of the evaporation method of liquid-waste monitoring, 4012

Cowan, P. and Hodgkin, D. C. A comparison of X-ray measurements on air-dried tobacco necrosis protein crystals with electron-microscope data, 3942

Cowan, R. D., Herzberg, G. and Sinha, S. P. Rotation-vibration spectra of diatomic and simple polyatomic molecules with long absorbing paths. IV. The spectrum of methyl fluoroform (CH_3CF_3) from 19μ to $0{\cdot}7\mu$, 2546; Erratum, 6875

Cowdrey, C. F. A note on the calibration and use of a shielded hot-wire anemometer for very low speeds, 1661

Cowhig, W. T. *See* Thonemann, P. C., 1860, 5429

Cowie, D. B. *See* Phillips, G. C., 9689

Cowley, J. M., Rees, A. L. G. and Spink, J. A. The morphology of zinc oxide smoke particles, 8254. Secondary elastic scattering in electron diffraction, 8365

Cowling, T. G. The calculation of radiative temperature changes, 4328

Cowper, G. Scintillation counting, 9550

Cox, E. G. *See also* Beard, D. S., 8349

Cox, E. G. and Jeffrey, C. A. Order/length relationships for π-bonds in heteronuclear molecules, 7161

Cox, H. L. *See* Rogers, J. D., 4237

Cox, J. F. *See* van den Dungen, F. H., 5054

Cox, R. T. The statistical method of Gibbs in irreversible change, 274

Coyle, M. B. An air-flow analogy for the solution of transient heat conduction problems, 2601

Crable, G. F. and Smith, W. V. The structure and dipole moment of SO_2 from microwave spectra, 4247

Craft, A. *See* Bradford, R., 8109

Craggs, J. D. *See also* Edels, H., 6246–7; Gaunt, H. M., 6234; Ravenhill, P., 8748

Craggs, J. D. and Meek, J. M. Recent research on spark discharges in gases, 2710

Craggs, J. W. The influence of compressibility in elastic-plastic bending, 9290

Craig, D. N. and Hoffman, J. I. A new method for determining the value of the faraday, 1814

Craig, D. P. The low excited states of simple aromatic hydrocarbons, 8104. *See also* Bevan, C. W. L., 8874; Coulson, C. A., 5640; Parr, R. G., 2901

Craig, D. S. *See* Brown, C. P., 7262

Craig, G. B. *See* Clark, R., 1484

Craig, R. A. The observations and photochemistry of atmospheric ozone and their meteorological significance, 9203

Crain, C. M. and Gerhardt, J. R. Some preliminary studies of the rapid variations in the index of refraction of atmospheric air at microwave frequencies, 4003

Cramer, F. Coloured addition compounds, 7795

Crandall, S. H. Iterative procedures related to relaxation methods for eigenvalue problems, 6674

Crandell, F. F., Freund, K. and Moen, L. Simplified index for colour of illuminants, 8666

Crane, E. E. Bioelectric potentials, their maintenance and function, 6655

Crane, W. W. T. *See* O'Kelley, G. D., 1992

Crank, J. Diffusion in media with variable properties. III. Diffusion coefficients which vary discontinuously with concentration, 8561

Crank, J. and Robinson, C. Interferometric studies in diffusion. II. Influence of concentration and orientation on diffusion in cellulose acetate, 1652

Craston, J. L. *See* Chasmar, R. P., 6910

Craven, J. H. *See* Yaffe, L., 6468

Craven, P. M. and Lambert, J. D. The viscosities of organic vapours, 3391

Crawford, B. L., Jr. *See also* Lancaster, J. E., 6128

Crawford, B. L., Jr and Dinsmore, H. L. Errata: Vibrational intensities. I. Theory of diatomic infra-red bands, 2895

Crawford, B. L., Jr and Fletcher, W. H. The determination of normal coordinates, 4027

Crawford, B. L., Jr, Fletcher, W. H. and Ramsey, D. A. Infrared spectra of CH_2N_2 and CD_2N_2, 4281

Crawford, F. H. Thermodynamic relations in n-variable systems in Jacobian form. I. General theory and applications to unrestricted systems, 273. On the use of curve differentials in thermodynamics, 5372

Crawford, F. S., Jr, Crowe, K. M. and Stevenson, M. L. Evidence concerning the reaction $p + p \rightarrow \pi^+ + d$, 6452

Crawford, J. H., Jr. *See also* Cleland, J. W., 6969

Crawford, J. H., Jr and Lark-Horovitz, K. Thermal equilibrium in neutron-irradiated semiconductors, 315

Crawford, M. F. *See also* Kelly, F. M., 1978

Crawford, M. F., Schawlow, A. L., Kelly, F. M. and Gray, W. M. An atomic beam source and spectrograph for hyperfine structure. Nuclear moments of silver, 2927

Crawford, M. F., Welsh, H. L., MacDonald, J. C. F. and Locke, J. L. Infra-red absorption of hydrogen induced by foreign gases, 2538

Crawford, S. G. A simple form of sensitive electric contact cup anemometer, 3230

Crawford, S. M. and Kolsky, H. Stress birefringence in polyethylene, 3469

Craya, A. Critical regimes of flows with density stratification, 6057

Creusot, J. *See* Tauzin, P., 524

Creutz, E. C. *See* Foss, M., 8049

Crewe, A. V. The multiple scattering of μ-mesons, 9716

Crewe, A. V. and Litherland, A. E. Effects of geometry on scattering distributions in the Wilson cloud chamber, 6285

Crews, R. W. Neutron yield for the Li + T reactions, 6459

Criddle, D. *See* Jura, G., 6540

Crino, B. Righini. *See* Righini Crino, B.

Criscuolo, E. L. and O'Connor, D. T. Natural crystal greenockite (cadmium sulfide) as an X-ray detector, 390

Critchfield, C. L. and Oleksa, S. The density of state in light nuclei, 4603

Crittenden, E. C. Early work in applied optics at the National Bureau of Standards, 6091

Crittenden, E. C., Jr. *See* Fawcett, S. L., 2727

Crocco, G. A. The temperature barrier of high altitude, long distance missiles, 6049

Cronemeyer, D. C. and Gilleo, M. A. The optical absorption and photoconductivity of rutile, 6855

Crooks, H. N. *See* Mapother, D., 658

Crosby, H. J. *See* Johnston, H. S., 7340

Cross, L. H., Richards, R. B. and Willis, H. A. The infra-red spectrum of ethylene polymers, 7707

Cross, L. H. and Rolfe, A. C. Molar extinction coefficients of certain functional groupings with special reference to compounds containing carbonyl, 8632

Cross, P. C. *See* Allen, H. C., Jr, 1744, 4277; Innes, K. K., 9633; Nixon, E. R., 961, 7752

Cross, W. G. and Ramsey, N. F. The conservation of energy and momentum in Compton scattering, 2989

Crosswhite, H. M., Steinhaus, D. W. and Dieke, G. H. Suppression of certain parts in spark spectra by electronic time switching, 5241

Crouch, M. F. *See* Sard, R. D., 8012

Crowe, K. M. *See also* Crawford, F. S., Jr, 6452

Crowe, K. M. and Hayward, E. Cascade showers in lead, 1095

Cruickshank, D. W. J. The accuracy of electron-density maps in X-ray analysis with special reference to dibenzyl, 2172

Crussard, C., Aubertin, F., Jaoul, B. and Wyon, G. Polygonization in strongly deformed metals, 7439

Crussard, C. and Jaoul, B. A contribution to the study of the form of the stress-strain curves of metals and its physical interpretation, 665

Crussard, J. Decay energy of beryllium-8 nuclei observed in cosmic ray stars, 2031

Crützen, J. L., Haase, R. and Sieg, L. Vaporization equilibria and heats of admixture in the system cyclohexane-n-heptane and methylcyclohexane-n-heptane, 3110

Cubero, M. *See* Brú, L., 3918

Cubicciotti, D. *See* Bernstein, R. B., 7302

Cuddeback, R. B. and Drickamer, H. G. Diffusion in solid sulphur, 7305

Cudworth, A. L. *See* Beranek, L. L., 5219

Cüer, P. On the mechanism of the absorption of nuclear mesons in nuclei, 1299. On the mechanism of the emission of nuclear mesons in nuclei, 1318. On the π-meson absorption and emission mechanisms in nuclei, 3788

Cüer, P. and Lonchamp-, J.P. Study of the reaction of thermal neutrons with boron, 7279

Cüer, P., van Rossum, L. and Morand, M. Nuclear evaporation and other phenomena produced by high energy neutrons, α particles, deuterons, π-mesons and by cosmic rays in photographic emulsions, 600

Cuffey, W. H. Coincidence studies in the radiations from Ba^{131}, 5727. *See also* Canada, R., 6441

Cuffey, W. H. and Canada, R. The energy of the metastable state of Ba^{135}, 8944

Cullen, A. L. Absolute measurement of microwave power in terms of mechanical forces, 7136

Cullis, C. F. *See also* Peard, M. G., 9044

Cullis, C. F. and Willsher, J. P. The thermal oxidation of methylamine, 9761

Culshaw, W. The Michelson interferometer at millimetre wavelengths, 1208

Cuninghame, W. A. F. *See* Bruce, C. F., 4130

Cunningham, B. B. *See also* Fleming, E. H., Jr, 7207

Cunningham, B. B., and Ghiorso, A. Thermal neutron fission of Am^{241}, 6469

Cunningham, G. L., Jr, Boyd, A. W., Myers, R. J., Gwinn, W. D. and Le Van, W. I. The microwave spectra, structure and dipole moments of ethylene oxide and ethylene sulfide, 6126

Cunningham, J. R. *See* Johns, H. E., 8776

Cunningham, R. G. Orifice meters with supercritical compressible flow, 7620

Cunningham, W. J. The growth of subharmonic oscillations, 6795

Cunsolo, D. *See* Brunelli, B., 2010

Curcio, J. A. and Petty, C. C. The near infrared absorption spectrum of liquid water, 5274

Curcio, J. A., Stewart, H. S. and Petty, C. C. A method for the determination of flame temperature from emission in the ultraviolet OH band, 5356

Curie, D. Note on nuclear radii, 8116. *See also* Vigean, F., 6139

Curie, I. and Faraggi, H. Autoradiography by neutrons. Separate dosage from U and Th in minerals, 5807

Curling, C. D. and Newton, J. O. Coincidences between protons and gamma-rays in (d, p) reactions, 613

Curran, S. C. *See* Cockcroft, A. L., 4459; Insch, G. M., 8165; Wilson, H. W., 8157

Curry, B., Hsi, E., Ambrose, J. S. and Wilcox, F. W. Bibliography. Supersonics or ultrasonics 1926–1949 with supplement to 1950, 6088

Curtis, A. R. Elasticity corrections for pendulums used in the absolute measurement of gravity, 9252

Curtiss, C. F. *See also* Buehler, R. J., 4175; Hirschfelder, J. O., 9764; Wentorf, R. H., Jr, 2648

Curtiss, C. F., Boyd, C. A. and Palmer, H. B. Thermodynamics of the critical point, 6939

Curtiss, C. F., Hirschfelder, J. O. and Adler, F. T. The separation of the rotational coordinates from the N-particle Schroedinger equation, 2891

Curtiss, L. F. *See* Manov, G. G., 5692

Cusano, D. A. *See* Studer, F. J., 7765

Custers, J. F. H. Laminations in type II diamonds, 4896

Cutler, C. C. and Quate, C. F. Experimental verification of space charge and transit time reduction of noise in electron beams, 3567

Cutolo, M. Self interaction of radio waves in the ionosphere, 4558

Cyphers, J. A. *See* Somers, E. V., 8676

Czerny, M., Kofink, W. and Lippert, W. Bolometer of low inertia, 922

Czyzak, S. J. and Williams, D. T. Static electrification of solid particles by spraying, 9436

Czyzewski, H. Branching of slip lines in alpha-brass, 7320

Daams, H. and Arlman, J. J. Design of and measurements with a simple double crystal spectrometer for small angle scattering, 9020

Daasch, L. W. and Smith, D. C. The infrared and Raman spectra of trimethylphosphine oxide, 4258

Dager, D. S. *See* Sanghi, I.

Dahlquist, C. A., Hendricks, J. O. and Taylor, N. W. Elasticity of soft polymers, 9026

Dailey, B. P. *See* Amble, E., 1961; Beard, C. I., 2905, 7173

Dain, J. *See* Fry, D. W., 1094

Dainton, A. D., Fowler, P. H. and Kent, D. W. A new method of determining the charge and energy of heavy nuclei in the cosmic radiation, 5532

Dainton, A. D., Gattiker, A. R. and Lock, W. O. The processing of thick photographic emulsions, 5967

Dainton, A. D. and Kent, D. W. Note on the heavy nuclei of the cosmic radiation, 411

Dainton, F. S. Radiation chemistry. IV. A review of the evidence for the production of free radicals in water consequent on the absorption of ionizing radiations, 9775

Dale, B. M. *See* Sorensen, B. N., 1269

Dale, E. B. *See also* Zimmerman, E. L., 2982

Dale, E. B., Richert, E. D., Redfield, T. A. and Kurbatov, J. D. The gamma-radiation of Ba^{131}, 2987

Dale, W. M. Radiation chemistry. V. Some aspects of the biological effects of ionizing radiations, 9775

Daletskiĭ, G. F. Optical anisotropy in styrol polymers and methylmethacrylate with an orientated particle arrangement, 2591

Dalin, A. and West, J. R. The viscosity of sulfur vapor, 1655

Dalitz, R. H. On higher Born approximations in potential scattering, 5125. On radiative corrections to the angular correlation in internal pair creation, 5718. On an alternative decay process for the neutral π-meson, 9717

Dallaporta, N. and Merlin, M. On the production of low-energy π-mesons in nuclear collisions, 3049

Dallavalle, J. M., Orr, C., Jr and Blocker, H. G. Fitting bimodal particle size distribution curves, 9079

Dallos, A. Pulse spectrograph, 8802

Daly, E. F. A double-beam infra-red spectrometer with fast-scanning cathode-ray tube display, 2503 A spectrocomparator for the analysis of mixtures using cathode-ray tube presentation of absorption difference spectra, 9801

Damon, P. E. Loop-line windowless flow Geiger counter, 8794

Danby, C. J., Buchanan, A. S. and Henderson, I. H. S. The kinetics of the photolysis of acetaldehyde. I. The determination of ethane and hydrogen in the reaction products by the use of a mass spectrometer, 8302

Danckwerts, P. V. Unsteady-state diffusion or heat-conduction with moving boundary, 125

Dandurand, P. and Holt, R. B. Electron density and light intensity decay in cesium afterglows, 5443. Electron removal in mercury afterglows, 6995

Danforth, W. E. Thoria as a cathode emitter, 7987

Daniel, C. Design of experiments for most precise slope estimation, 8432

Daniel, J. H. and Brackett, F. S. An electrical method for investigating the nature and behavior of small, airborne, charged particles, 5875

Daniel, V. and Stark, K. H. Dielectric properties of ketones, 4365

Daniels, F. B. On the propagation of sound waves in a cylindrical conduit, 147

Daniels, J. M. A 100-kilowatt water-cooled solenoid, 2844

Danielson, G. C. *See* Huibregtse, E. J., 9463

Danilov, V. I. and Kamenetskaya, D. S. On the "spheroidization" of metallic particles, 3058

Danjon, A. and Couderc, P. On the distribution of stellar luminosities among the nearer stars, and connected notes, 1583

Danninger, R. and Sirk, H. The theory of the pressure drop in a glow discharge subjected to a magnetic field, 9510

Dannis, M. L. and Shipman, J. J. Infrared and Raman spectra of vinylidene cyanide, 4253

Danos, M. Resonances in (γ, n) processes, 7266. *See also* Steinwedel, H., 1236

Danos, M. and Steinwedel, H. Multipole oscillations of the protons with respect to the neutrons in the liquid drop model of the atomic nucleus, 7177

D'Ans, J. and Breckheimer, W. Potential of the iron electrode, 9064

Danusso, F. On the measurement of variations in internal energy by ultrasonic methods. Contribution to the study of the structure of liquids, 4150. Ultrasonic velocity and adiabatic compressibility of athermic ideal liquid mixtures, 6065

Dänzer, H. The theory of the shot and Johnson noise, 5400

Darby, E. K. *See also* Johns, H. E., 9880; Morrish, E. K., 2498

Darby, E. K. and Johns, H. E. A radon measuring device, 5686

Darby, E. K. and Opechowski, W. Energy dependence of the beta-gamma angular correlation in Sb^{124}, 8935

Darby, J., Hatton, J. and Rollin, B. V. The attainment of very low temperatures by a two-stage adiabatic demagnetization process, 268. Superconductivity of lead sulphide, selenide and telluride, 324

Dardel, G., von. *See* von Dardel, G.

Darling, B. T. Irreducible volume character of events. I. A theory of the elementary particles and of fundamental length, 1595

Darmois, E. The problem of the H^+ ion in electrolytic solutions, 2130

Darmois, E., Epelboin, I. and Amine, D. Role of ion hydration in the electrolytic polishing bath, 2127

Darmon, S. E. and Rudall, K. M. Infra-red and X-ray studies of chitin, 7732

Darwent, B. de B. The quenching of mercury resonance radiation. I. The effective cross sections of paraffin hydrocarbons, 2510. The decomposition of excited ethylene, 5851

Das, P. M. *See also* Khastgir, S. R., 3241

Das, P. M. and Khastgir, S. R. Some random fading records with short-wave signals, 766

Das, R. K. An automatic pressure stabilising device for a diaphragm type Wilson cloud chamber, 3593. A triggering device for arc discharge lamps used in cloud chamber photography, 5502. On alpha-disintegration. I. Some useful theoretical tabulations and graphical plots, 6421

Das Gupta, K. A new type of X-ray scattering, 1492. The soft X-ray valence band spectra and the heat of formation of chemical compounds and alloys, 1866. A new type of X-ray scattering, 4907

Dash, J. G. *See also* Boorse, H. A., 261, 1015

Dash, J. G. and Boorse, H. A. Transport rates of the helium II film over various surfaces, 6931

Dash, J. G., Cook, D. B., Zemansky, M. W. and Boorse, H. A. Design and performance of a Joule–Kelvin helium liquefier, 2620

Dash, W. C. *See* Sproull, R. L., 7377

Datar, M. G. *See* Prasad, M., 489

Datsev, A. B. Linear problem of Stephan: case of alternating phases, 3482

Datta, S. *See* Majumdar, S. K., 2679

Dattan, W. Contribution to abnormal refraction of ultra-short-waves in the atmosphere, 8064

Dätwyler, G. Contribution to hot-wire methods, 140. New methods of measurement with a hot-wire anemometer, 1660. Measurement of high temperatures in gas streams, 8701

Daudel, R. Wave mechanics, radioactivity and cancer, 8404. Some new types of radioactivity, 8910. Can radioactive time constants be modified by external influences? 8915. *See also* Chalvet, O., 1962; Coulson, C. A., 7162

Daudin, A. and Daudin, J. The effect of temperature on counters and radio tubes, 7978. A new demonstration of the creation of nuclear showers by unstable particles, 7998

Daudin, A., Daudin, J. and Robley, R. Counter observations of nuclear bursts, 5531

Daudin, J. Two counter systems for the investigation of nuclear showers, 398. Interpretation of nuclear showers and electronic component in cloud chamber photographs, 419. *See also* Carmouze, G., 1157, 7997; Daudin, A., 5531, 7978, 7997

Daunt, J. G. An empirical correlation among superconductors, 2701. *See also* Heer, C. V., 4344

Daunt, J. G. and Mendelssohn, K. Film transfer in helium ii. I. The thermo-mechanical effect, 1801

Dauphinee, T. M. The vapor pressure of mercury from 40°c to 240°c: (5 microns to 6 cm) measured by the streaming method, 4334

Dauphinee, T. M., Ivey, D. G. and Smith, H. D. The thermal conductivity of elastomers under stretch and at low temperatures, 2598

Dautrebande, L. Influence of temperature on the micellary size of salt aersols, 1440

Davenport, D. E. *See* Amdur, I., 2758

Davenport, L. L., Lavetelli, L., Mack, R. A., Pote, A. J. and Ramsey, N. F. A dee biasing system for a frequency modulated cyclotron, 8781

Davidenkov, N. N., Zhakovskaya, I. S. and Zhuravlev, V. A. Variation of the elastic modulus in torsion, 2089

Davidson, D. Reflexion of high frequencies during auroral activity, 4004

Davidson, D. W., Auty, R. P. and Cole, R. H. A transient method for measurement of dielectric polarization, 9449

Davidson, D. W. and Cole, R. H. Dielectric relaxation in glycerine, 1819

Davidson, H. R. Visual sensitivity to surface color differences, 4960

Davidson, H. R. and Fuller, D. L. A simple analogue computer for thermodynamic calculations, 6937

Davidson, H. R., Godlove, I. H., Lambert, J. M. and Wright, G. J. An illuminant-converting filter for use with the automatic tristimulus integrator, 2550

Davidson, H. R. and Luttringhaus, H. A Munsell color book in textiles, 8667

Davidson, J. P., Jr. The first forbidden shape factor and the $f_{n}t$ products for beta-decay, 4666

Davidson, K. A. *See* Bowen, E. G., 9201

Davidson, N. *See* Sullivan, J. H., 4832

Davidson, P. M. The boundary conditions at a mist-water interface, 6778

Davies, A. E. *See* Bockris, J. O'M., 4839

Davies, C. W. Ion exchange resins in chromatography, 729

Davies, D. *See* Dawson, J. K., 8845

Davies, D. A. *See* Billington, C., 5265

Davies, D. E. *See* Jones, F. Llewellyn, 6235, 6241

Davies, D. R. A note on Rayleigh's problem for a plate of finite width, 1659

Davies, J. A., Kay, R. L. and Gordon, A. R. Transference numbers for sodium and potassium chlorides in anhydrous methanol at 25°c, 7345

Davies, J. H., Lock, W. O. and Muirhead, H. Energies of β-particles from the decay of μ-mesons, 634

Davies, J. T. Measurement of contact potentials at the oil-water interface, 3502. The distribution of ions under a charged monolayer, and a surface equation of state for charged films, 7599

Davies, M. and Thomas, O. Studies of the carboxyl group. I. The geometrical structure, 8316

Davies, P. T. The setting of single crystals for zero layer curve photographs, 2165

Davies, R. M., Owen, J. D., Edwards, D. H. and Thomas, D. E. A discussion on detonation: pressure measurements in detonating gases, 3126

Davies, T. V. The theory of symmetrical gravity waves of finite amplitude. I, 8554

Dauvillier, A. The (time) variation and the origin of cosmic rays, 8820

Dauvillier, M. A. On the secular variation of the geomagnetic field, 6614

Davion, M. *See* Chrétien, A., 7601

Davis, C. F. *See* Kip, A. F., 9599

Davis, H. *See also* Morrical, K. C., 1689

Davis, H., Fernandez, C. and McAuliffe, D. R. On the theory of hearing. Process of electric excitation of hearing, 8396

Davis, H., Silverman, S. R. and McAuliffe, D. R. Some observations on pitch and frequency, 4204

Davis, J. H. *See* Bates, L. F., 1191

Davis, J. W. *See* Dodd, C. G., 9788

Davis, L., Jr. The strength of interstellar magnetic fields, 4045. An orbit-bender to assist injection into betatrons, 4423

Davis, M. and Thompson, N. Creep in a precipitation-hardened alloy, 1376

Davis, R. H. *See* Schoen, A. L., 6496; Tochilin, E., 361

Davis, W., Jr. *See* Shiflett, C. J., 1260

Davis, W. C. *See* Ballard, S. S., 2599

Davis, W. O. Energy and density distribution of cosmic-ray neutrons, 1153

Davisson, C. M. and Evans, R. D. Measurements of gamma-ray absorption coefficients, 4674

Davisson, J. W. *See* Burstein, E., 5900

Davoine, F. *See* Bernard, R., 1172, 7354

Davydov, A. S. Dispersion theory of molecular crystals. II, 7722

Dawson, I. M. Crystal structure of a low molecular weight protein. Electron microscopy of β-lactoglobulin crystals, 9180

Dawson, I. M. and Vand, V. Observation of spiral growth-steps in *n*-paraffin single crystals in the electron microscope, 4790, 6561

Dawson, J. K. Magnetochemistry of the heaviest elements. III. The halides of ter- and quadri-valent uranium, 4535. *See also* West, D., 7240

Dawson, J. K., Mandleberg, C. J. and Davies, D. Magnetochemistry of the heaviest elements. IV. Plutonium trifluoride and trichloride, 8845

Dawson, L. R. and Chaudet, J. H. The effects of added chlorides on the absorption spectra of cobaltous chloride in water and in formamide, 6864

Dawson, L. R., Leader, G. R. and Zimmerman, H. K., Jr. The conductivity of concentrated electrolyte systems as a function of temperature and concentration, 6530

Dawson, M. H. *See* Alexander, B. H., 4807

Dawton, D. I. *See* Dolbear, D. W. N., 3616

Dawton, R. H. *See* Allen, W. D., 1850–1

Day, A. G. The development of a vacuum torsion balance and its use to measure sorption in dielectrics, 8542

Day, F. A. G. *See* Corner, J., 2027

Day, M. J. and Stein, G. Chemical dosimetry of ionising radiations, 7200

Dayal, B. The isothermals of rocksalt rom its thermal expansion, 1027

Dayhoff, M. O. *See* MacInnes, D. A., 8544

Daymond, S. D. The resistance of a rectangular metal plate with an internal electrode, 5401

De, M. L. An experimental study of the illuminating system of the electron microscope, 1102

Deacon, E. L. Radiative heat transfer in the air near the ground, 1540. A portable recording pressure-plate anemometer, 7403. The over-estimation error of cup anemometers in fluctuating winds, 8373

de Alemany, J. Català. *See* Català de Alemany, J.

Dean, R. B. The gibbs—a rational unit for adsorption, 9792

Dean, W. R. Slow motion of viscous liquid in a semi-infinite channel, 2414

Dean, H. M. *See* Mohler, F. J., 2155

Dean, R. B. and Dixon, W. J. Simplified statistics for small numbers of observations, 5006

de Azcona, J. M. López. *See* López de Azcona, J. M.

Deb, S. Emission decay in oxide-coated cathode due to gaseous adsorption, 6293. On the poisoning of oxide-coated cathode due to adsorption of particles liberated from the anode, 9565

De Barr, A. E. Magnetic materials and ferromagnetism 9591

De Barr, A. E. and MacArthur, I. Summarized proceedings of conference on high-intensity X-ray beams —London, April, 1950 (conf. rep.), 2722

de Beauclair, W. Logarithmic chart for complex and oscillation calculations, 3257
de Beauclair, W. and Singowitz, U. Investigations on Fourier synthesis of the charge distribution in crystals. Volume II. Table of phase factors for crystallographic two-dimensional Fourier synthesis of a forty-eight-point network, containing 91 tables of this function cos $2\pi hx$ cos $2\pi ky$, 5916
de Beauregard, O. Costa. *See* Costa de Beauregard, O.
Debiesse, J. The use of radioactive elements in the study of oxide cathodes, 1894
Debiesse, J., Challansonnet, J. and Neyret, G. The use of radioactive elements for the study of oxide cathodes, 3599
Debiesse, J., Neyret, G., Challansonnet, J. and Amoignon, J. Influence of radioactivity on the thermionic emission from cathode, 7986
de Bock, A. Measurement of the propagation velocity of sound in liquids at low temperatures, 4213. *See also* Van Itterbeek, A., 1674
de Boer, J. and Gorter, C. J. Erratum: Statistical mechanics of liquid mixtures of He^3 and He^4, 262
Debot, R. The measurement of the granularity of photographic images, 6670
de Broglie, L. On the convergence of the integrals in the problem of vacuum polarization, 67. On a new form of the theory of the "subtracted field," 838. Lagrangian form of the theory of subtractive fields, 5102. On the possibility of a complex structure for the particles of spin different from $\frac{1}{2}$, 7536. *See also* Kwal, B., 7538
de Brouckère, L. *See* Prigogine, I., 120, 3385
de Bruijn, H. The kinetics of catalytic reactions in inhomogeneous surfaces, 1418. *See also* Bueche, F., 6902; Nauman, R. V., 7353
Debye, P. and Bueche, A. M. Light scattering by concentrated polymer solutions, 2588
Debye, P. and Bueche, F. Electric moments of polar polymers in relation to their structure, 5642. The dielectric constant of polystyrene solutions, 6200
Debye, P. and Cashin, W. M. Effect of small refractive index differences between solution and solvent on light scattering, 4313
de Carvalho Ferreira, R. Acidity and the systems of acids and bases, 7358
de Castro, H. Determination of the constants K and vo in the seismological formula $t = 2/k . \sinh^{-1}kx/2v_0$, 3949
Dechesne, J. *See* Monfils, A., 1757
Decius, J. C., Steele, W. C. and Snyder, R. G. The carbon-hydrogen stretching modes of trioxane, 6872
Decker, B. F. *See also* Kasper, J. S., 3912
Decker, B. F. and Harker, D. Relations between initial and final orientations in rolling and annealing of silicon ferrite, 7083
Decker, C. E., Meister, A. G. and Cleveland, F. F. Substituted methanes. VI. Force constants and calculated thermodynamic properties for some trifluoromethanes, 6375
Decker, W. B. *See* Offner, A., 5008
Dedrick, J. H. and Kuczynski, G. C. Electrical conductivity method for measuring self-diffusion of metals, 1342
Defay, R. Surface tension of a crystalline surface, 3057
Deffet, L. Research and technique in the region of high pressures, 1386
de Ficquelmont, A. M. *See* Moureu, H., 3864, 4844
De Ford, D. D. and Andersen, D. L. The effect of ionic strength on polarographic half-wave potentials, 696
Degallier, M. Zero inefficiency anticoincidence circuit, 4474
Degner, W. *See* Schreibner, H., 160
de Graaff-Hunter, J. The geodetic uses of gravity measurements and their appropriate reduction, 3306
de Gramont, A. The variation of the elastic modulus of quartz lamina as a function of thickness, 3087
de Greve, L. *See* van Itterbeek, A., 4779, 5363, 6209
de Groot, S. R. *See also* Tolhoek, H. A., 4668–9, 5720, 6739, 8504
de Groot, S. R., Jansen, L. and Mazur, P. Non-equilibrium thermodynamics and liquid helium II, 1809. Non-equilibrium thermodynamics of two-fluid models, 6179
de Groot, S. R. and Tolhoek, H. A. Electric and chemical potentials; different methods of treatment and their relation, 8294
de Groot, W. A graphical method for solving problems of low-level photometry, 8610
de Groot, W. and Kruithof, A. A. The colour triangle, 998–9
Degtyarev, M. M. Energy absorption in deformations of opposite sign in copper, 2096
de Haas, E. Graticules as guides in electron-microscope metallography, 663
de Heer, I. A note concerning l-type doubling in axially symmetric molecules, in particular with reference to molecules belonging to the symmetry groups C_{4v} and V_d, 8102
de Hemptinne, M. *See* Courtoy, C., 4275; van Riet, R., 2569
Dehmelt, H. G. Nuclear quadrupole frequencies in crystalline iodine compounds, 952
Dehmelt, H. G. and Krüger, H. Quadrupole resonance of Cl and Br nuclei in crystalline dichloroethylene and methylbromide, 7147
de Hoffmann, F. and Teller, E. Magneto-hydrodynamic shocks, 1945
Deitz, V. R. *See* Carpenter, F. G., 3059; Loebenstein, W. V., 3875
de Jager, C. *See also* Pecker, J.-C., 6695
de Jager, C. and Neven, L. The profiles of the lines of the Paschen and Brackett series of hydrogen in the solar spectrum, 2337
de Jager, C. and Pecker, J.-C. Interpretation of the measurements of radial velocities of the solar granules, 6694
Déjean, J. *See* Laporte, M., 4322
Dejonc, P. *See* Maréchal, A., 230
DeJuren, J. Nuclear cross-sections for 270-Mev neutrons, 1330. Angular distribution of neutrons from the bombardment of Be by 340-MeV protons, 5744
DeJuren, J. and Moyer, B. J. Variation with energy of nuclear collision cross-sections for high energy neutrons, 5783
de Kármán, T. *See also* von Kármán, T.
de Kármán, T. and Fabri, J. Supersonic flow in two dimensions along a curved wall, 2448
Dekhtyar, M. V. On the rectangular magnetic hysteresis loop of a ferromagnetic deformed in the temperature interval of recrystallization, 498
Dekker, A. J. *See also* Leverton, W. F., 1827, 3516; Morrish, A. H., 2557
Dekker, A. J. and Urquhart, H. M. A. On the capacity of porous aluminum oxide layers, 1345
de Klerk, D. *See* Steenland, M. J., 5581, 5586
Delabarre, Y. *See* Corliss, L., 495
Delahay, P. and Perkins, G. Oscillographic polarography. Phenomena occurring during the quiescent period of the voltage wave, 9109
Delahay, P. and Stiehl, G. L. Oscillographic polarography. Improved method of measurement and causes of errors, 9108
Delalande, A. *See* Trillat, J.-J., 2186, 4911
Delaney, C. F. G. Beta-activity of potassium, 3737. *See also* Poole, J. H. J., 6623
Delaney, J. C. A galvanometer scale for the direct reading of intensities, 2496
Delannoy, N. *See* Lutz, A., 2157
Delano, V. and Goodman, C. Shielding properties of the concrete wall of the M.I.T. cyclotron, 1334
de la Perrelle, E. T. *See* Jones, F. Llewellyn, 4425, 8749
de la Ripelle, M. Fabre. *See* Fabre de la Ripelle, M.
de Lattre, A. *See* D'Or, L., 8639
de Launay, J. *See* Steele, M. C., 5423
Delbecq, C. J., Pringsheim, P. and Yuster, P. A new type of short wavelength absorption band in alkali halides containing color centres, 5272
Delbourgo, R. and Laffitte, P. Inflammability ranges of propane-air mixtures under reduced pressure, 7336
Delcroix, J.-L. and Boutry, G.-A. The space charge in a magnetron in the static régime of cut off; cylindrical magnetron, 7979
Delfosse, J. M. *See* Nève de Mévergnies, M., 3597
Del Grosso, V. A. *See* Weissler, A., 118, 5180
Delhaye, J. Contribution to the study of stellar velocity distribution, 3289

Della Corte, M. *See* Bousser, F., 3610

Delourmel, T. and Herpin, A. Magnetostriction in a rotating field, 8867

de Lozé, C. The ultraviolet spectra of aneurin and of cocarboxylase in presence of ethyl pyruvate and of a mixture of acetaldehyde and pyruvic acid, 7741

Del Pianto, E. and Quercia, I. F. Electronic differential nephelometer, 3468

Delsasso, L. P. *See* Anderson, N. S., 6799

Delsemme, A. H. Infra-red and Raman spectra of para-difluorobenzene, 2529

Delval, J. The principle of least constraint applied to the dynamics of incompressible fluids, 2411

de Malleman, R. and Suhner, F. Magnetic rotatory power of tetranitromethane. Rotativity of the C–NO$_2$ link, 3688. Magnetic rotary powers of methane and ethylene, 8073. Magnetic rotatory powers of neon and of nitrous oxide, 8074

de Mallemann, R., Suhner, F. and Grange, J. Investigation of the magnetic rotatory powers of the principal gases, 5618

de Mallemann, R., Suhner, F. and Malevergne, A. Magnetic rotatory powers of gaseous and liquid dimethyl ether, 5619. Magnetic rotatory power of carbon bisulphide at low temperature, 8072

De Marco, A. *See* Ballario, C., 8008, 9575

de Marco, L. *See* Belliboni, G., 8826

de Mathov, E. M. Anomalies in the absorption curve of cosmic rays in lead, 3613

Demers, P. Continuous method of preparation of photographic emulsions specially sensitive to ionizing particles, 2271. Cosmic-ray investigations with special photographic emulsions, 4023. Cosmic-ray events in very thick photographic emulsions, 8009

Demers, P., Courtemanche, R. and Lamarche, G. Observation in photographic emulsion of the anisotropy of cosmic rays at high altitude, 1166

Demeshina, A. I. *See* Skanavi, G. I., 6205

Demeur, M. *See also* Geheniau, J., 4112

Demeur, M. Spatial energy distribution of neutrons in a capturing moderator, 3051

de Mévergnies, M. Nève. *See* Nève de Mévergnies, M.

Dempster, J. R. H. Note on the relation between Feynman's formulation of scattering problems and the Born approximation, 3339

Denbigh, K. G. *See* Raumann, G., 1643

Denes, P. and Cartier, F. A. Frequency differential threshold for quality in pure tones, 3414

Denis, P.-M. *See* Béné, G. J., 539, 1967, 2915, 6384, 8897

Denisse, J.-F. *See also* Blum, E.-J., 2330, 3281, 4047

Denisse, J.-F., Steinberg, J. L. and Zisler, S. Control of the geomagnetic activity by the centres of solar activity distinguished by their radio-electric properties, 7465

Denizot, F. *See* Dérouet, B., 9502

Dennis, S. C. R. *See* Allen, D. N. de G., 9225

Denniston, D. W., Jr. *See* Karlovitz, B., 5355

de Nobel, J. Heat conductivity of steels and a few other metals at low temperatures, 8678

Denton, E. J. *See* Pirenne, M. H., 7429

Deodhar, G. B. and Mande, C. Spin doublets in the *L*-spectrum of platinum, 4413

de Possel, R. and Pouget-Michel, C. On the Huyghens principle for an e.m. wave, 7110

Déribéré, M. The metallurgical examination of surfaces by fluorescence, 1335

der Mateosian, E. *See also* Goldhaber, M., 8920; Scharff-Goldhaber, G., 8919

der Mateosian, E. and Goldhaber, M. Measurement of isomeric transition energies with a scintillation spectrometer, 6437. Two-step isomeric transition in Hf^{179m}, 8946

Dérouet, B. and Denizot, F. Demonstration of the Debye effect at 80 kc/s in colloidal solutions of arsenic sulphide and in electrolytic solutions of potassium chloride, 9502

de-Shalit, A. Magnetic moments of odd nuclei, 1975. On the deviations of magnetic moments from the Schmidt lines, 9636. *See also* Frauenfelder, H., 1272; Huber, O., 5698

d'Espagnat, B. Production of high-energy mesons, 477. The measurement of the scattering of tracks in photographic emulsions; elimination of spurious scattering, 5732

Dessens, H. Some remarks on the study of the microphysics of natural clouds, 4938

Dessens, H. and Fert, C. Specimen grids made from spiders webs for electron microscopy, 4789

Destenay, D. Crystal structure of triphyline, 1504

Destriau, G. and Mattler, J. Effect of temperature rise on the phenomena of electrophoto-luminescence, 1759

Desvignes, F. *See* Terrien, J., 2493

de Troyer, A., van Itterbeek, A. and van den Berg, G. J. Measurements on the thermal diffusion of Ne–H$_2$, Ne–D$_2$ and Ne–He mixtures at liquid hydrogen temperatures, 1654. Measurement on the viscosity of liquid helium by means of the oscillating disc method, 4341

Deutsch, M. Evidence for the formation of positronium in gases, 5380. Angular correlations in nuclear reactions, 7251. Three-quantum decay of positronium, 8904. *See also* Boyer, K., 5474; Goldhaber, M., 8920; Shure, K., 5715; Stevenson, D. T., 8937; Wright, W. M., 5695

Deutsch, M. and Scharff-Goldhaber, G. Decay of 10·7-min Co^{60m}, 9664

Deutsch, M. L. *See* Clark, O. H., 110

de Vaucouleurs, G. Observations of twilight discontinuities, 3237. The constants of Rayleigh scattering in gases and liquids, 5327

Devaux, H. The adherence of monomolecular layers to their support, 3833

Devienne, M. Determination of thickness of a thin film obtained by condensation of artificial radioactive elements, 5140

Devin, C. *See* Tourneux, C., 8314–15

Devons, S. and Lindsey, G. R. γ-radiation from the resonant capture of protons by ^{7}Li nuclei, 1302

de Voogt, A. H. Radio echoes right round the globe, 2234

DeVore, H. B. and Dewdney, J. W. Photoconductivity and photoelectric emission of barium oxide, 7898

DeVore, J. R. Refractive indices of rutile and sphalerite, 6557

de Vries, H. Rotatory power and other optical properties of certain liquid crystals, 6155

de Vries, H., Jielof, R. and Spoor, A. Properties of the human eye with respect to linearly and circularly polarized light, 2242

Dew, G. D. and Sayce, L. A. On the production of diffraction gratings. I. The copying of plane gratings, 6149

de Waele, A. Thixotropy and electrical behaviour, 711. *See also* Mardles, E. W., 9075

de Waele, A. and Rainbird, R. W. Electrical behaviour of non-aqueous disperse systems, 3508

de Walden, S. The frequency selectivity of the ear as determined by masking experiments, 8395

Dewan, J. T. *See also* Allen, K. W., 1314, 5759, 5789

Dewan, J. T. and Allen, K. W. Chart recording of microsecond pulse amplitudes, 1131

Dewar, M. J. S. Colour and constitution. I. Basic dyes, 726

Dewdney, J. W. *See* DeVore, H. B., 7898

DeWire, J. W., Ashkin, A. and Beach, L. A. Absorption of 280-Mev photons, 5772, 8178

DeWire, J. W. and Beach, L. A. High energy bremsstrahlung and pair production, 8950

Dexter, D. L. Note on the absorption spectra of pure and colored alkali halide crystals, 6856. Oscillator strength for the α- and β-bands in alkali halide crystals, 8635. *See also* Sachs, R. G., 1031

Dexter, D. L. and Beeman, W. W. Note on the fluorescence yield of argon, 5294

Deysine, A. *See* Bonét-Maury, P., 5872

Dhar, N. R. Action of light on colouring matters and their oxidation, 8300

Dhar, S. *See* Chatterjee, S., 3587

Dharmatti, S. S. *See also* Arnold, J. T., 5663; Prasad, M., 489

Dharmatti, S. S. and Weaver, H. E., Jr. The magnetic moment of S^{33}, 8132

D'Henry, G. On the physical nature of microseisms, 3217

Dibeler, V. H. *See also* Reese, R. M., 5506

Dibeler, V. H. and Bernstein, R. B. Isotope effect on dissociation probabilities in the mass spectra of chloroform and chloroform-*d*, 4486

Dibeler, V. H. and Cordero, F. Diaphragm-type micromanometer for use on a mass spectrometer, 3355

Dibeler, V. H. and Mohler, F. L. Mass spectra of the deuteromethanes, 5505

Dibeler, V. H., Mohler, F. L., Wells, E. J., Jr and Reese, R. M. Mass spectra of some simple isotopic molecules, 2932

di Bernardo, A. and Tyler, J. E. Test for fluorescence, 7763

Dick, W. *See* Orgel, L. E., 4583

Dicke, R. H. *See* Newell, G., Jr, 9385

Dickey, J. New aspects of the photoelectric emission from Na and K, 4389

Dickey, J. E. and Taft, E. A. Photoelectric changes induced in SrO and BaO by ultraviolet irradiation, 1845

Dickinson, W. C. Hartree computation of the internal diamagnetic field for atoms, 1984. The time average magnetic fields at the nucleus in nuclear magnetic resonance experiments, 4613

Dickson, D. V. Nomogram and slide-rule for solution of spherical triangle problems found in radio communications, 8425. Multiple traversal of cyclotron targets, 9533

Dickson, J. M. *See also* Cassels, J. M., 7946, 9532; Randle, T. C., 8960

Diehl, C. C. H. *See* Langstroth, G. O., 2611

Dieke, G. H. *See also* Crosswhite, H. M., 5241; Donahue, T., 3547

Dieke, G. H. and Robinson, E. S. The molecular spectrum of He^3, 947

Dieke, G. H. and Tomkins, F. S. The $3p^3\Sigma 2s^3\Sigma$-bands of TH and T$_2$, 6844

Dieminger, W. The scattering of radio waves, 3657. On the synchronization of ionospheric echoes in oblique incidence transmission, 7133

Dienes, G. J. Frequency factor and activation energy for the volume diffusion of metals, 660. On the volume of diffusion of metals, 6491. Kinetics of ordering in the alloy AuCu, 8290. *See also* Fleeman, J., 2106; Parkins, W. E., 8272

Diesselhorst, H. On the resistance of an electrically heated conductor and the determination of the Wiedemann–Franz number, 329

Dietrich, I. Benedicks effect in fine-crystalline metal wires, 6232

Di Francia, G. Toraldo. *See* Toraldo Di Francia, G.

Digges, T. G. *See* Jenkins, W. D., 2110

Dighton, D. T. R. A balance indicator with high input impedance using a cathode follower, 5230

Dijker, A. J. *See* Clay, J., 417

Dijkstra, L. J. and Wert, C. Effect of inclusions on coercive force of iron, 505

Dillon, J. F. *See* Beams, J. W., 4122

Dilworth, C. C., Goldsack, S. J., Goldschmidt-Clermont, Y. and Levy, F. The magnetic deflection of fast charged particles in the photographic emulsion, 467

Dimmock, N. A. Production of uniform droplets, 875

Din, F. *See* Clark, A. M., 3111

Dingle, J. R. and Le Roy, D. J. Kinetics of the reaction of atomic hydrogen with acetylene, 3132

Dingle, R. B. The diamagnetism of free electrons in finite systems, 7071

Dingle, R. B. and Shoenberg, D. The de Haas–van Alphen effect, 1176

Dinsmore, H. L. *See* Crawford, B. L., Jr, 2895

Dirac, P. A. M. A new meaning for gauge transformations in electrodynamics, 2369. Generalised Hamiltonian dynamics, 4083. The Hamiltonian form of field dynamics, 4088

Distad, M. F. Equilibrium currents induced in zinc-blende by electron bombardment of negative electrode, 2751

Divan, L. Continuous absorption by interstellar matter, 8443. *See also* Chalonge, D., 48, 4060

Divari, N. B. On the pressure of solar radiation upon atoms of various gases, 5991

Diven, B. C. and Almy, G. M. Photo-disintegration of silver and aluminium, 2047

Dixit, K. R. Photographic emulsion studies of the latitude effect, 5533

Dixon, A. E. Orbital rockets. II. The rocket structure with special reference to expendable construction, 6763

Dixon, J. K. *See* Judson, C. M., 1453, 5883

Dixon, W. J. *See* Dean, R. B., 5006

Dixon, W. R. Self absorption corrections for large gamma-ray sources, 7247

Dizer, M. On an apparent earth-effect on sunspot activity, 2333

Djurković, P.-M. On a method of determining the irregularities of the pivots of an Askania–Bamburg reversible transit instrument, 9232

Djurle, E. *See* Ingelstam, E., 6899

Dmitriev, V. A. A metallic monocrystal in a magnetic field, 7062

Dobischek, D. *See* Jacobs, H., 5465

Dobrin, M. B. Dispersion in seismic surface waves, 3956

Dobrotin, N. *See* Azimov, S., 9568

Dobrotin, N. A. *See also* Verkhovskiĭ, B. I., 8818

Dobrotin, N. A., Graevskaya, Ya. I., Grigorov, N. L., Nikolskiĭ, S. I. and Rappoport, I. D. The spectrum of the ionizing particles of the soft and hard components of the cosmic radiation, 8813

Dobson, G. M. B. Physics of clouds and precipitation, 4939

Dobson, R. H. *See* Brewer, A. W., 2200, 9200

Dodd, C. The surface tension of supercooled phenyl ether, 9310. *See also* Andrade, E. N. Da C., 1637

Dodd, C. and Roberts, G. N. Dielectric loss and dielectric constant measurements in supercooled liquids, 292

Dodd, C. G., Davis, J. W. and Pidgeon, F. D. Measurement of specific surface areas of non-porous powders by a pressure-decline liquid permeability method, 9788

Dodd, R. E. Rate constants in the high temperature photolysis of acetaldehyde, 3867

Dodson, H. W. and Weston, E. B. A study of the eruptive prominence of 1948 September 27, 2335

Doehler, O. *See* Warnecke, H., 2874

Doescher, R. N. The heat of dissociation of fluorine, 7827

Dognon, A. and Simonot, Y. Cavitation and haemolysis by ultrasonics of different frequencies, 7630. Cavitation and haemolysis by ultrasonics of different frequency, 8601

Dolbear, D. W. N. *See also* Elliot, H., 6305

Dolbear, D. W. N. and Elliot, H. Seasonal and diurnal variations in cosmic ray intensity, 6306

Dolbear, D. W. N., Elliot, H. and Dawton, D. I. The cosmic ray intensity and radio fade-outs, 3616

Dole, V. P. and Cotzias, G. C. A nomogram for the calculation of relative centrifugal force, 6761

Dolecek, R. L. Adiabatic magnetization of a superconductor, 5422

Dolginov, A. Z. Angular correlation of α-particles and γ-quanta emitted in cascade, 2962. Correlation between directions of a β-electron and a γ-quantum in successive emission, 7228. Angular correlation between the electron formed during pair conversion and the γ-quantum emitted during the subsequent nuclear transition, 7239

Dollfus, A. Observation of an atmosphere around the planet Mercury, 3277. Determination of the atmospheric pressure on the planet Mars, 5017. Interpretation of the polarization of light reflected by the different regions of the surface of the planet Mars, 9237

Domb, C. The statistics of correlated events. I, 16. *See also* Brooks, J. E., 6760

Domenicali, C. A. Null-coil pendulum magnetometer; and Magnetic and electrical properties of natural and synthetic single crystals of magnetite, 8831

Donahue, D. J. *See* Browne, C. P., 7262

Donahue, T. and Dieke, G. H. Oscillatory phenomena in direct current glow discharges, 3547

Donald, H. B. *See* Kannuluik, W. G., 2602

Donaldson, J. and Watson, W. W. Effect of turbulence in thermal diffusion columns, 6780

Donnay, G. and Donnay, J. D. H. The one-dimensional crystal. III. A punched-card method for computing structure factors, 2173

Donnay, J. D. H. *See* Donnay, G., 2173

Donoghue, J. J. and Eatherly, W. P. A new method for precision measurement of the Hall and magnetoresistive coefficients, 8077

Donoghue, J. J., Vollrath, R. E. and Gerjuoy, E. The tensile strength of benzene, 4136

Donovan, B. *See* Conn, G. K. T., 2819

Doolittle, A. K. Studies in Newtonian flow. I. The dependence of the viscosity of liquids on temperature, 7587

D'Or, L., de Lattre, A. and Tarte, P. Spectroscopic evidence of the dimerization of NO in the gaseous state, 8639

D'Or, L. and Tarte, P. Rotational isomerism in nitrous acid and alkyl nitrites, 8638

Doremus, J. A. Telemetering system for radioactive snow gage, 4915

Dorendorf, H. Ultra-violet absorption bands of photochemically-treated crystals of potassium chloride and bromide, 5871

Dorfman, L. M. *See* Gomer, R., 4816

Dörnenburg, C. and Fleischmann, R. The dependence on angle of incidence of the variation of phase change on reflection at silver, 5312

Dornfeld, E. G. *See* Reisner, J. H., 370

Dorrestein, R. General linearized theory of the effect of surface films on water ripples. I, 7594

Doscher, T. M. and Mysels, K. J. The effect of gegen ions on the light scattering by solutions of colloidal electrolytes, 5331

Dossier, B., Jacquinot, P., Maréchal, A. and Pieuchard, G. On improving the precision of longitudinal location of an optical image, 5326. Measurements of the precision of longitudinal positioning, 7783

Doty, P. and Steiner, R. F. Light scattering and spectrophotometry of colloidal solutions, 709

Douglas, A. The Baldwin electronic organ, 1685

Douglas, A. E. and Herzberg, G. Predissociation and dissociation of the N_2 molecule, 8624

Douglas, C. H. *See* Taplin, G. V., 6538

Douglas, D. L. and Yost, D. M. The magnetic susceptibility of europium and samarium amalgam, 1922. Errata: The photo-chemical reduction of water by europium (*II*) ion, and the magnetic susceptibilities of europium (*II*) and europium (*III*) ions, 3148

Douglas, H. W. The influence of sugars on the electrokinetic potential and interfacial tension between aqueous solutions and certain organic compounds. I. The electrophoretic behaviour of organic dispersions. II. The interfacial tension between aqueous sugar solutions and (1) a liquid paraffin and (2) *n*-undecyl alcohol, at 25°c, 3534

Douglas, R. A. *See* Johns, H. E., 3021; Katz, L., 5770

Douglas, T. B., Ball, A. F. and Ginnings, D. C. Heat capacity of liquid mercury between 0° and 450°c; calculation of certain thermodynamic properties of the saturated liquid and vapour, 5369

Douslin, D. R. *See* Beattie, J. A., 6923

Dovell, W. H. and Barrow, R. F. A new ultra-violet band system of SiF, 2521

Dow, W. G. *See* Welch, H. W., Jr, 4480

Dowd, J. J. Optical properties of selenium, 9361

Dowden, D. A. and Reynolds, P. W. Some reactions over alloy catalysts, 1422

Dowling, P. H. Circuit for the Barnes color meter, 7794

Downer, A. N. *See* Brunt, J. J., 6499

Downs, D., Walsh, A. D. and Wheeler, R. W. A study of the reactions that lead to "knock" in the spark-ignition engine, 8282

Drabkina, S. I. Theory of the development of the channel of the gas discharge, 6985

Drain, L. A. *See* Morrison, J. A., 9091

Draper, J. E. A scintillation counter for thermal neutrons, 8798

Dravnieks, A. Action of hot ionized gases upon zirconium and copper, 9760

Drazin, M. P. The general motion of a sphere in a viscous liquid, 2418

Drell, S. D. Low energy photomeson production in hydrogen, 8199. On the interaction of induction electrons with lattice vibrations, 8743

Drenan, J. W. *See also* Wall, F. T., 5892

Drenan, J. W. and Hill, T. L. A study of the two-component van der Waal's fluids, 1665

Drenck, K. and Pepinsky, R. New X-ray diffraction tubes of high brilliance, 7931

Drenick, R. The perturbation calculus in missil ballistics, 6762

Dreving, V. P. *See* Avgul, N. N., 6546

Dreyfus, B. *See also* Soutif, M., 9634

Dreyfus, B., Major, J. K. and Radvanyi, P. A stud of Cd^{109} in the cloud chamber, 4684

Dreyfus-Graf, J. Sonograph and sound mechanics 2486

Drickamer, H. G. *See* Cuddeback, R. B., 7305 Giller, E. B., 2436; Robb, W. L., 879, 7605 Scott, E. J., 8562

Drigo, A. On the magneto-resistance of thin ferro magnetic films, 525

Driver, K. S. *See* Webster, F. V., 2826

Drodofsky, M. and Slevogt, H. The theory o anallactic points, 249

Drozhzhina, V. I., Shabalina, E. F. and Yanus, R. I Measurement of small differences of magneti fluxes by a ballistic galvanometer, 2817

Drucker, D. C. *See* Edelman, F., 8264; White G. N., Jr, 681

Druesne, M. A. A. *See* Prichard, A. C., 1824

Drukarev, G. F. Determination of the phase of th wave function in particle scattering: a correction 7563. On the theory of the passage of particle through a potential barrier, 8528

Drumaux, P. The recession of the extra-galacti nebulae. VI, 2343

Drummond, D. G. [Ed.] The practice of electron microscopy, 3804

Druyvesteyn, M. J. The variation of the resistivity o some metals with elastic deformation, 9496

Druzhinin, I. G. *See* Shepelev, A. I., 3187

Druzhinin, V. V. *See* Goldman, A. L., 1926

Dubiago, A. D. On the structure of cometary nucle and the formation of meteor streams, 29

Dubinin, M. M. and Timofeev, D. P. Investigations on the adsorption of benzene vapours by active carbon black, 4863

Dubois, G., Kling, R. and Vieilledent, E. The study of a trans- or super-sonic field of (fluid) flow by means of ultrasonic waves, 7615

Dubois, J. Contribution to the study of earth shadow I, 8381; II, 8382

Dubois-Violette, P.-L. Influence of the transfer of heat on the stability of temperature controllers, 8674–5

Duchesne, J. The role of molecular vibrations in chemical reactivity, 536. The role of hybridization and resonance in molecular structure, 4591. *See also* Burnelle, L., 1213

Duchesne, J. and Burnelle, L. Bond-bond interactions in linear and angular molecules, 9094

Duchesne, M. *See* Lallemand, A., 8607

Duckworth, H. E. *See also* Kegley, C. L., 8150

Duckworth, H. E., Kegley, C. L., Olson, J. M. and Stanford, G. S. Some new values of atomic masses, principally in the region of 82 neutrons, 8909

Duckworth, H. E. and Preston, R. S. Some new atomic mass measurements and remarks on the mass evidence for magic numbers, 5675

Duckworth, H. E., Stanford, G. S., Olson, J. M. and Kegley, C. L. The mass of S^{32}, 4618

Duclaux, J. Gas theory and the equation of state. X. Compressibility of nitrogen and corresponding states, 2456

Duclaux, J. P.-E. On the theory of a gas thermometer giving the thermodynamic temperature without corrections for imperfections of the gas, 1810. On the impossibility of composing the helium λ point to a triple point, 8708. On the probable existence of two states of helium in the gaseous phase, 9426

Due Rojo, A. and Gimeno Riutort, A. The thermic factor in the generation of microsisms, 6608

Dufay, J. Investigations on the spectra of lightning flashes, II. Study of the spectrum in the violet and ultraviolet regions, 9859

Dufay, J. and Dufay, M. Study of the emission spectrum of the night sky from 6 800Å to 9 000Å, 3993

Dufay, J. and Tcheng, M. L. Investigations on the spectra of lightning flashes. I. A study of the spectra, from 3 830 to 6 570Å by means of slit spectrographs, 9858

Dufay, M. A new vibration-rotation band of the molecule OH in the spectrum of the night sky, 8385. *See also* Dufay, J., 3993
Duff, G. F. D. Factorization ladders and eigenfunctions, 6037
Duffey, G. H. Dodecahedral octacovalent bond orbitals, 2898. Hexacovalent bond orbitals. III, 4868; IV, 4865. Tripyramidal bond orbitals, 5651. A seemingly forbidden octacovalent structure, 7172
Duffield, R. B. *See also* Giller, E. B., 2436; Huizenga, J. R., 6462
Duffield, R. B., Hsiao, L. and Sloth, E. N. Radioactivities of Nb^{99}, Ta^{185}, and W^{185}, and the relative (γ, n) and (γ, p) cross section of Mo^{100}, 1278
Duffield, R. B. and Langer, L. M. Radioactivities of Ru^{105}, Rh^{105}, Br^{84}, and Br^{83}, 3731
Duflot, J. and Chaudron, G. The influence of deformation by Piobert lines on the charging of Fe with cathodic H, 1486
Dufour, A. *See* Ricard, R., 9366
Dufour, C. Evaporation of thin uniform layers of controlled thickness. Electronic applications, 662. Investigations on the luminosity, contrast and resolution of interfering systems with multiple beams. The use of complex thin films, 4307
Dufour, C. and Locquin, M. An interference filter for use as a phase plate in "phase contrast," 7779
Dugas, C. *See* Aigrain, P., 5882
Dugas, C. R. *See* Aigrain, P. R., 7862
Dugger, G. L. Flame propagation. I. The effect of initial temperature on flame velocities of propane-air mixtures, 2617
Duke, D. Intensities of the interstellar band at λ4430, 3293
Dukelskiĭ, V. M., Zandberg, E. Ya. and Ionov, N. I. Negative ions in the gaseous discharge in the vapours of halides of the alkali and alkaline earth metals, 8806
Dulmage, W. J. and Lipscomb, W. N. The crystal structures of hydrogen cyanide, HCN, 9151
Dumézil-Curien, P. Entropy of a mixture of excited and ionized gases in equilibrium, 6189. On certain nuclear reactions of astrophysical importance. II. Creation of electron pairs. Influence on the formation of neutrons, 6716
Dumézil-Curien, P. and Schatzman, E. On certain nuclear reactions of astrophysical importance. III. Hydrogen suddenly raised to a temperature of several milliard degrees, 6717
DuMond, J. W. M. The masses of the negative and positive electrons, 4359
DuMond, J. W. M. and Cohen, E. R. Least-squares adjusted values of the atomic constants as of December, 1950, 5061
Dumontet, P. *See* Blanc-Lapierre, A., 4317, 5321
Dumoulin, E. *See* Michels, A., 3852
Dunbar, D. N. F. *See also* Wilson, A. R. W., 3767
Dunbar, D. N. F. and Hirst, F. Angular distribution of protons from Li$^{6}(d, p)$Li^{7*}, Li^{7}, 7261
Dunbar, J. Y. *See* LeBel, C. J., 8605
Duncan, A. B. F. *See* Liu, T.-K., 4284; Tanner, K. N., 5287
Duncan, D. B. and Perry, J. E. The transmutation of N^{14} by protons, 7257
Duncan, J. F. *See also* Cook, G. B., 4461
Duncan, J. F. and Glueckauf, E. Theory of sorption columns, 6543
Duncan, W. J. The characteristics of systems which are nearly in a state of neutral static stability, 3346
Duncanson, W. E. *See* Heyland, G. R., 7054
Dungen, F. H., van den. *See* van den Dungen, F. H.
Dungey, J. W. A note on magnetic fields in conducting materials, 485. Derivation of the dispersion equation for Alfvén's magneto-hydrodynamic waves from Bailey's electromagneto-ionic theory, 8062
Dunkelman, L. *See* Baum, W. A., 1788
Dunlap, W. C. *See* Hall, R. N., 1832
Dunlop, S. H. and Emeleus, K. G. The electron energy distribution in helium, 6984
Dunn, A. F. *See* Welsh, H. L., 4278
Dunn, H. K. Calculation of vowel resonances, and an electrical vocal tract, 1696; Erratum, 5217
Dunning, H. N. *See* Washburn, E. R., 5153
Dunning, W. J. and Patterson, D. The flow properties of elastic dispersions, 3365, 9027
Dunnington, F. G. *See* Hemenway, C. L., 1138
Dunoyer, J.-M. Mechanism of the action of a gas on a solid, 3802. On the electrical properties of thin films of germanium, 7873
Dunoyer, L. Notes on formulae for the flow of rarefied gases through tubes, 2437. On drying by evaporation in vacuo, 5352
Dunstädter, H. *See* Koch, O., 4409
Dunster, H. J. *See* Cavanagh, P. E., 2985
Duperier, A. Temperature of the upper atmosphere and meson production, 4496
Dupuy, O. *See* Arnulf, A., 4966–7
Duquesne, M., Kayas, G. and Renard, G. A. The radiation from Co^{60}, 1281
Durand, E. Potential and field of a particular type of cylindrical lens, 3564
Durant, R. L. Characteristics of some further films suitable for use in industrial radiography, 4017
Durbins, R., Loar, H. and Steinberger, J. The spin of the pion via the reaction $\pi^{+}+d \rightleftharpoons p+p$, 8223
Durham, G. S. and Hawkins, J. A. Solid solutions of the alkali halides. II. The theoretical calculation of lattice constants, heats of mixing, and distribution between solid and aqueous phases, 4771
Durie, D. S. L. The refractive indices of lithium fluoride, 3426
Durie, R. A. The spectra flames supported by fluorine, 941. The visible emission spectra of iodine and bromine monofluorides and their dissociation energies, 6845
Durrum, E. L. Two-dimensional electrophoresis and ionophoresis, 9106
Dustmann, I. and Masing, G. On the resistance of intermetallic compounds, 7849
Dutkinskiĭ, U. P. *See* Brumberg, E. M., 3185
du Toit, S. *See* Bishop, G. R., 1307, 4723
du Toit, S. J. *See* Slätis, H., 587
Dutta, A. K. Molecular motion in fluids and internal dispersion and absorption of elastic and optical waves, 7638
Dutta, M. On a treatment of imperfect gas after Fermi's model. III, 7567
Dutton, G. F. Gramophone turntable speeds, 7648
Duval, C. *See also* Pascal, P., 7714
Duval, C. and Lecomte, J. Determination of the degree of polymerization of metallic mineral salts by means of infra-red absorption spectra, 7731
DuVall, R. B. *See* Young, C. W., 7737
Duwez, P. The allotropic transformation of hafnium, 9423. *See also* Green, L., Jr, 4144; von Karman, T., 680
Dwight, K. *See* Winckler, J. R., 451
Dwyer, F. P., Gyarfas, E. C. and Mellor, D. P. Instantaneous electron transfer and interaction absorption, 2131
Dyakina, M. E. *See* Shirmazan, M. G., 6381
Dyakov, G. I. Law governing the even effects when approaching saturation, the internal elastic tensions being taken into account, 3674
Dyer, H. B. The crystal structure of cysteylglycine-sodium iodide, 2187
Dymond, E. G. *See* Pullar, J. D., 8827
Dyne, P. J. and Style, D. W. G. Excitation of OH- and SH-band systems in fluorescence, 6884
Dyson, F. J. Heisenberg operators in quantum electrodynamics. I, 5090; II, 7523. The renormalization method in quantum electrodynamics, 6740. The Schrödinger equation in quantum electrodynamics, 8507
Dyson, J. An interferometer microscope, 1785. An interferometer microscope for opaque objects, 4319
Dzhelepov, B., Zhukovskiĭ, N. and Kholnov, Yu. γ-Radiation of Co^{60}, 6433. γ-Radiation from Ag^{110}, 9671
Dzhelepov, B. S. On the natural width of the γ-level of Cl^{36*}, 4679. Accurate focusing of Compton electrons, 6254. *See also* Antoneva, N. M., 3728, 6430; Baskova, K. A., 8775; Voikhanskiĭ, M. E., 564
Dzhelepov, B. S. and Bashilov, A. A. The ketron: a magnetic spectrometer with improved focusing, 4427
Dzhigit, O. M. *See* Avgul, N. N., 6546
Dziobek, W. On the brightness-attenuation of photographic objectives, 8410

Eady, E. T. The cause of the general circulation of the atmosphere, 4927

Easley, M. A. Probe technique for the measurement of electron temperature, 5442. *See also* Kenty, C., 7922

Easley, M. A. and Mumford, W. W. Electron temperature vs. noise temperature in low pressure mercury-argon discharges, 6993

Eastwood, W. S. An isotope calculator, 4629. Gamma radiography in the United Kingdom, 9898

Eatherly, W. P. *See* Donoghue, J. J., 8077

Ebe, M. *See also* Motokawa, K., 6658, 7427

Ebe, M., Isobe, K. and Motokawa, K. Physiological mechanisms of color blindness, 5951

Eberl, W. On the multiplication of real numbers, 2298

Eby, F. S. *See* Jentschke, W. K., 6894

Eckardt, A. and Lindig, O. Illumination of phosphors by ultrasonic waves, 219

Eckart, C. The ray-particle analogy, 8555 *See also* Isaacs, J. D., 5151

Eckart, G. On the reflection of electromagnetic waves at a discontinuity in the permittivity gradient, 517. The propagation of e.m. waves in slightly heterogeneous layers, 5609. *See also* Kahan, T., 2865

Eckart, G. and Kahan, T. On the "internal" reflection in a stratified medium with special reference to the troposphere, 1948. On "internal reflection" in a transparent medium with application to the troposphere, 7128

Ecker, G. Theory of the polarization of canal rays. I. Elementary processes, 2761. II. Calculation of the polarization values and comparison with measurements, 4457

Eckfeldt, E. L. and Perley, G. A. Measurement of and effect of temperature on electrical resistance of glass electrodes, 3863

Edamoto, I. The fine structure of *K*-series X-ray emission spectra of the elements Mn(25)–Zn(30) and Ge(32), 7927

Edelman, F. and Drucker, D. C. Some extensions of elementary plasticity theory, 8264

Edels, H. The determination of the temperatures of an electrical discharge in a gas, 1862. The relationship between the radial concentration variations of excited atoms and electrons in a discharge in thermal equilibrium, 5428. A technique for arc initiation, 7919

Edels, H. and Craggs, J. D. Excitation temperatures of hydrogen arcs, 6246. Balmer line widths in hydrogen arcs, 6247

Eden, M. *See also* Pratt, A. W., 9864

Eden, M., Pratt, A. W. and Kahler, H. A microtome specimen holder advanced by thermal expansion, 1357

Eden, R. J. The quantum mechanics of non-holonomic systems, 3342. The Hamiltonian dynamics of non-holonomic systems, 3348

Edmonds, F. N., Jr. Scattering by a moving electron atmosphere and its effect on spectral lines. I. The Schuster problem, 54. II. The planetary nebula problem, 55

Edmunds, I. G. and Qurashi, M. M. The structure of the ζ-phase in the silver-zinc system, 9146

Edsall, J. T. *See* Scheraga, H. A., 8664

Edson, E. F. Occupational radiation hazards, 2262

Edwards, D. H. *See* Davies, R. M., 3126

Edwards, E. V. and Garoff, K. Fabrication of a high power resonant wave-guide window, 1201

Edwards, J. W. *See also* Skinner, G. B., 3488

Edwards, J. W., Johnston, H. L. and Blackburn, P. E. Vapor pressure of inorganic substances. IV. Tantalum between 2 624 and 2 943°K, 3487

Edwards, J. W., Speiser, R. and Johnston, H. L. High temperature structure and thermal expansion of some metals as determined by X-ray diffraction data. I. Platinum, tantalum, niobium and molybdenum, 4908. Structure of barium titanate at elevated temperatures, 8358

Edwards, R. R. *See* Meschan, I., 4977; Schwartz, H. M., 5674

Edwards, W. D. Some results on the electrical breakdown of liquids using pulse techniques, 8756

Eeckhout, J. *See* Gillis, J., 4887–8

Egan, J. P. *See also* Klumpp, R. G., 4211; Warren, J. M., 4210

Egan, J. P. and Klumpp, R. G. The error due to masking in the measurement of aural harmonics by the method of best beats, 5214

Egan, J. P. and Meyer, D. R. Changes in pitch of tones of low frequency as a function of the pattern of excitation produced by a band of noise, 2258

Egelstaff, P. A. Inelastic scattering of cold neutrons, 9731

Egelstaff, P. A. and Taylor, B. T. Slow neutron cross-sections of molybdenum and bromine, 2052. Slow neutron cross-section of bromine, 6466. Slow neutron cross-sections of zirconium and hafnium, 7280

Egerton, A., Moore, N. P. W. and Lyn, W. T. Ignition of methane-air mixtures by rapid compression, 3495

Egerton, A. and Warren, D. R. Kinetics of the hydrogen/oxygen reactions. I. The explosion region in boric acid-coated vessels, 2118

Eggen, O. J. Photoelectric studies. IV. Color-luminosity array for stars in the region of the sun, 5036. V. Magnitudes and colors of classical cepheid variable stars, 5037. VI. Color-luminosity arrays for stars in Praesepe and in M 39, 6703. VII. Color and magnitude systems for brighter stars and the color-spectral-type relation, 6704. VIII. Positional effect in photomultipliers and some revised magnitudes in the North Polar sequence and Harvard region C 12, 7476

Eggenberger, D. M. *See* Copeland, P. L., 1893

Ehrenberg, A. *See* Theorell, H., 8842

Ehrenberg, A. S. C. Estimation of heterogeneous error variances, 790

Ehrenberg, W. The production of converging beams by total reflexion, 2722. *See also* Ansbacher, F., 5412

Ehrenberg, W. and Hirsch, J. The conductivity-temperature characteristics of lead sulphide: the influence of oxygen and of the rate of heating, 7881

Ehrenberg, W., Lang, C. S. and West, R. The electron voltaic effect, 7021

Ehrenberg, W. and Spear, W. E. A fine focus X-ray tube, 2722. An electrostatic focusing and its application to a fine focus X-ray tube, 3566

Ehrenhaft, F. On photophoresis, the true magnetic charge, and the helical motion of matter in [various] fields. I, 7649

Ehrenhaft, F., Herzog, R. F. K., Higatsberger, M. J., Viehböck, F. P. and Weinzierl, P. M. A new type of discharge in magnetic fields, 335

Ehrenhaft, F. and Reeger, E. Photophoresis, and the pressure exerted by light on matter in a vacuum, 171. On transverse photophoresis, 6822. On photophoresis in very high vacuum, 9355

Ehrenhaft, F., and Reeyer, E. Photophoresis and a property of solar light producing a rotation of matter in a vacuum, 170

Ehrenhaft, F. and Stockinger, F. Magnetic properties of acids and bases. (Preliminary communication), 8082

Ehrman, J. B. On the displacement of corresponding energy levels of C^{13} and N^{13}, 4600

Eichholz, G. G. and Flack, F. C. The diffusion of thoron atoms through photographic gelatin, 4772

Eidinoff, M. L. and Knoll, J. E. The measurement of radioactive hydrogen in solid samples—comparison with gas counting, 563

Eĭdus, L. Kh. *See also* Podgoretskiĭ, M. I., 2787

Eĭdus, L. Kh., Alymova, M. M. and Videnskiĭ, V. G. A study of the density spectrum of atmospheric showers of cosmic particles, 3608

Eĭdus, L. Kh., Blinova, N. M., Videnskiĭ, V. G. and Suvorov, L. D. Study of wide showers of cosmic particles at sea level, 2786

Eĭgenson, L. S. Some linear and planar problems of steady potential field for a variable coefficient of conductivity, 2654

Eĭgenson, M. S. *See* Ioffe, S. B., 2306

Einsporn, E. Improving the quality and the testing of optical flats, 992

Einstein, A. The Bianchi identities in the generalized theory of gravitation, 4075.* The advent of the quantum theory, 4077

Einstein, A. and Infeld, L. On the motion of particles in general relativity theory, 4074

Eirich, F. *See* Newman, S., 4855

Eirich, F. R. *See* Schoenberg, M. D., 1439

Eischens, R. P. Isotopic exchange rates as criteria of surface heterogeneity, 5850

Eisemann, K. Electromagnetic fields as catalysts, 3131

Eisenbud, L. On the theory of angular correlation phenomena, 4114

Eisenschitz, R. Recent theories of transport processes in liquids, 3384

Eisenstein, A. The leaky-condenser oxide cathode interface, 2777

Eisenstein, J. Electromagnetic relaxation in superconductors, 5424

Eisinger, J. T. *See* Pohlman, W. B., 8145

Eisner, E. Phase change of light on reflection at a mica-silver interface, 5309. *See also* Hamermesh, M., 644

Ekedahl, E., Högfeldt, E. and Sillén, L. G. Kinetics and equilibria of ion exchange, 1446. Theory of sorption columns, 6543

Ekelöf, S. and Lundquist, B. The mechanical differential analyser at the Chalmers Institute of Technology—a mathematical machine at the disposal of technical and natural science research, 1567

Ekstein, H. Multiple elastic scattering and radiation damping. I, 7535

Ekstein, H. and Schiffman, T. Elastic vibrations of almost cubic parallelepipeds, 9341

El-Bedewi, F. A. The range of protons from the reaction ^{14}N(n,p)^{14}C in Ilford C2 photographic emulsion, 7027

El-Bedewi, F., Middleton, R. and Tai, C. T. Angular distribution of the two long-range neutron groups of the reaction O^{16}(d,n)$^{-17}$, 9696

Elbert, D. *See* Chandrasekhar, S., 2222

Elby, F. P. *See* Benesch, W. M., 3286

Elder, J. T. *See* Benesch, W. M., 3286

Eldredge, J. H. *See* Jacobson, L. O., 7433

Eley, D. D. A calculation of heats of chemisorption, 1415. Adsorption and catalysis on metals. Introductory paper II, 2126. *See also* Couper, A., 1421

El Gobeily, M. A. *See* Razouk, R. I., 2142

Elias, J. Baltá. *See* Baltá Elias, J.

Elkins, T. A. The second derivative method of gravity interpretation, 3954

El Komoss, S. G. *See* Nikitine, S., 7720

Eller, G. von. *See* von Eller, G.

Elliot, H. *See also* Dolbear, D. W. N., 3616, 6306

Elliot, H. and Dolbear, D. W. N. Directional measurements of the diurnal variation of cosmic ray intensity, 6305

Elliot, J. O. *See* Liebson, S. H., 3450

Elliott, A. *See also* Ambrose, E. J., 3172, 5271, 5909, 7730

Elliott, A. and Ambrose, E. J. Evidence of chain folding in polypeptides and proteins, 7725

Elliott, G. A. Thermodynamic equilibrium, 1813, 6938

Elliott, H. A. *See* Woonton, G. A., 4550

Elliott, J. F. and Chipman, J. The thermodynamic properties of binary liquid cadmium solutions, 4356

Elliott, J. P. and Jahn, H. A. Two-body nuclear interaction, consistent, within the limits of a single configuration, with the spin and magnetic moment of the ground-states of lithium-6, boron-10 and lithium-7, 2918

Elliott, N. *See* Corliss, L., 495; Stoenner, R., 7100

Elliott, R. J. and Stevens, K. W. H. A preliminary survey of the paramagnetic resonance phenomena observed in rare ethyl sulphates, 4534

Elliott, T. A. *See* Addison, C. C., 3163–5

Ellis, J. W. *See* Glatt, L., 4287

Ellis, R. H., Jr. *See* Rossi, H. H., 1987, 2009

Ellison, M. A. Ionospheric effects of solar flares, 3979. Source points of radio noise bursts associated with solar flares, 6692

Elmer, J. T. *See* Wise, J. H., 1742

el Nadi, M. Are mesons complex particles? 3040. Dirac's equation in a Riemann space with an asymmetrical metric, 3332. Calculation of the molecular diameters from Sutherland's constant, 5645

Elnick, M. *See* McGinnis, C. S., 6817

El-Sabban, M. Z., Meister, A. G. and Cleveland, F. F. Substituted ethanes. III. Raman and infrared spectra, assignments, force constants, and calculated thermodynamic properties for 1, 1, 1-trichloroethane, 7735

Elsas, A. and Vogt, E. Change of sign of the magnetostriction coefficient due to tension. II, 8079

Elsasser, W. M. Quantum-theoretical densities of solids at extreme compression, 4810

Elser, K. and Hoch, M. Behaviour of various gases and separation of mixtures of gases in a vortex tube, 5169

Elsey, P. J. *See* Shimizu, H., 1496

El-Sherbini, M. A. The characteristics of secondary emission, 7016

Elsmore, B. *See* Ryle, M., 9234

Elston, A. W. *See* Lord, J. J., 459

Elton, G. A. H. Contact angles and surface tensions in liquid/solid systems, 8558

Elton, L. R. B. The effect of nuclear structure on the elastic scattering of fast electrons, 375

Eltsin, I. A. Film method of determining the dielectric constant and the loss angle in the cm-wave range, 2662

Elvey, C. T. Progress in studies of the airglow in upper air research, 2220

El Wakkad, S. E. S. The electrochemical behaviour of the antimony electrode, 1428

El Wakkad, S. E. S. and Hickling, A. The anodic behaviour of metals. VI. Cobalt, 1429

Emeléus, H. J. The transuranics and other newly discovered elements, 718

Emeléus, K. G. Turbulence in gaseous conductors, 3529. *See also* Dunlop, S. H., 6984; Neill, T. R., 3543

Emeléus, K. G., Sayers, N. D. and Bailey, R. A. Possibility of measuring a quadrupole transition probability from an auroral afterglow, 537

Emeléus, K. G. and Smith, G. A. Production of recombination spectra, 6994

Emerson, W. H. *See* Rado, G. T., 1178

Emery, E. W. Radioactive decay of I^{181}, 8923. *See also* Rose, G., 9546; Sinclair, W. K., 575

Emmerich, W. S., John, G. and Kurbatov, J. D. Gamma-transitions in the disintegration of cerium 144, 7246

Emmerich, W. S. and Kurbatov, J. D. Radiations of Nd^{147}, 6431. The disintegration of Nd^{147}, 7218

Emmett, P. H. *See* Kummer, J. T., 4814

Emmons, H. A. *See* Lauderdale, R. A., 8402

Emschermann, H. H. and Umstätter, H. Luminescence photography, 4987

Emslie, A. G. *See* King, G. W., 6100

Enatsu, H. On the interaction of mesons and nucleons, 5119

Enatsu, H. and Pac, P. Y. On the mass of the cohesive meson and the mass difference of nucleons, 8522

Enderby, J. A. On electrical effects due to sound waves in colloidal suspensions, 6981

Endt, P. M., Van Patter, D. M., Buechner, W. W. and Sperduto, A. Excited states of Si^{29} from an investigation of the P^{31}(d, α) Si^{29} and Si^{28}(d, p)Si^{29} reactions, 8193

Enge, H., Buechner, W. W., Sperduto, A. and Van Patter, D. M. Energy levels at 31 keV in Al^{28} from Al^{27}(d, p)Al^{28} reaction, 7264

Engel, A. von. *See* von Engel, A.

Engelder, T. C. *See* Allen, J. S., 7038

Engelkemeir, D. Beta-decay of 7·5-day Ag^{111} to a 0·1 microsecond excited state of Cd^{111}, 6418

Engelkemeir, D. W. *See* Freedman, M. S., 571

England, T. S. *See also* Schneider, E. E., 7091

England, T. S. and Schneider, E. E. Hyperfine structure and saturation effects in the paramagnetic resonance spectrum of manganese, 496

Engler, H. D. *See* Brix, P., 7678

Engström, A. Use of soft X-rays in the assay of biological materials, 6655. Some comparison between X-ray and ultra-violet absorption in different tissue and cell structures, 7926

Ennor, A. H. and Rosenberg, H. Errors in determination of specific activity and turnover rates of radioactive isotopes, 9652

Ensell, G. and Chatterjee, S. D. A circular Geiger–Mueller counter, 9547

Enüstün, B. V. *See* Baxendale, J. H., 1388

Epelboin, I. On the utilization of Foucault currents for the study of ferromagnetic substances, 5570. Limitation of the range [of applicability] of the Rayleigh law in alternating fields discussed in the light of recent theoretical and experimental investigations, 7068. *See also* Abadie, P., 1040; Darmois, E., 2127

Epheser, H. and Schlomka, T. Surface area and electrodynamic boundary conditions for moving bodies, 3311
Eppelsheimer, D. S. and Penman, R. R. Thermal dilation of copper, 2606. Accurate determination of the lattice of beta-titanium at 900°c, 3209
Eppstein, J. S. A single channel pulse analyser for nuclear experiments, 2773
Epstein, H. On the structure of monolayers and multilayers of polar hydrocarbon molecules on solid substrates, 1344
Epstein, L. I. The edge effect in phase contrast, 4321
Epstein, L. I. and Herriott, D. R. An extension of Toraldo's theory of phase contrast. II, 1007
Epstein, P. S. and Plesset, M. S. On the stability of gas bubbles in liquid gas-solutions, 2428; Erratum, 4158
Epstein, S. *See* McKinney, C. R., 562
Erastov, L. N. *See* Kalashnikov, S. G., 5404
Erben, T. Theory of ionic association in strong electrolytes, and calculation of the elementary ionic charge, 6529
Erginsoy, C. Neutral impurity scattering in semiconductors, 1051. On the mechanism of impurity band conduction in semiconductors, 3519
Ergun, A. N. Cases of superposable fluid motions, 3360
Erickson, W. L. Moment of inertia experiment, 9291
Ernst, P. J. Ultrasonography, 4179
Eros, S. *See* Barnes, B. T., 1073
Ertaud, A. Neutron diffusion and the theory of atomic piles, 9005
Ertaud, A. and Beaugé, R. Measurement of the temperature of the neutrons in the reflector of a heavy water pile, 8211
Esaki, L. *See* Arizumi, T., 1147–8, 6264
Escande, L. A particular study of certain jets, 2416
Eselson, B. N. and Lazarev, B. G. Some properties of solutions of He^3 in He^4. I. Separation of the helium isotopes, 6928
Eselson, B. N., Lazarev, B. G. and Alekseevskiĭ, N. E. Measurement of vapour pressure of solutions of He^3 in He^4, 9428
Eselson, B. N., Lazarev, B. G. and Lifshits, I. M. Some properties of solutions of He^3 in He^4. II. Displacement of the λ-point and peculiarities of the transport effect, 6929
Eshbach, J. R., Hillger, R. E. and Jen, C. K. Nuclear magnetic moment S^{33}, 2923
Eshelby, J. D., Frank, F. C. and Nabarro, F. R. N. The equilibrium of linear arrays of dislocations, 5827
Espagnat, B. d'. *See* d'Espagnat, B.
Ess, H. and Rossel, J. Some properties of diamond as a crystal counter, 1125
Essen, L. The velocity of propagation of electromagnetic waves derived from the resonant frequencies of a cylindrical cavity resonator, 1711. Proposed new values for the velocity of light, 4219
Essen, L. and Froome, K. D. The dielectric constant and refractive index of air and its principal constituents at 24 000 Mc/s, 5616
Essigmann, M. W. *See* Chang, S. H., 3419
Estabrook, F. B. Absolute oscillator strengths of chromium and nickel, 7191
Etkin, B. and Szebehely, V. G. Comments on Truesdell's paper on Bernouilli's theorem for viscous compressible fluids, 2412
Etter, L. E. Essentials of stereoscopic roentgenography, 9899
Ettinger, G. M. The tracing and interpretation of asymmetrical hysteresis loops, 503
Etzel, H. W. *See* Aigrain, P. R., 7862
Eubank, H. *See* Bachman, C. H., 9563
Eubank, W. R. Precision thermostat for high temperatures, 1023
Eubanks, R. A. *See* Sternberg, E., 9744
Eucken, A. On the existence of active centres in chemical adsorption and contact catalysis, 1412
Eudier, M. *See* Laurent, P., 664
Euler, J. Progress in the field of optical pyrometry, 1940–50, 2636. *See also* Cario, G., 9409
Euler, J. and Ludwig, R. Two nomograms for use in measurements with optical pyrometers, 1022
Evans, A. G. and Hamann, S. D. Energy and entropy changes of organic reactions. I. Two-stage reactions. II. One-stage reactions. III. Ionization reactions. IV. Theoretical considerations, 3855
Evans, D. J. Experiments on the boundary conditions at a mist-water interface, 6779
Evans, D. M., Layton, D. N. and Wilman, H. The deformation of copper and iron crystals by unidirectional abrasion, 3190
Evans, E. A. and Huston, J. L. Isotope effect in the oxidation of carboxyl-C^{14} acetic acid, 9048
Evans, E. C. *See* Skvarla, J. E., 6783
Evans, G. W., II. A note on the existence of a solution to a problem of Stefan, 9415
Evans, G. W., II, Isaacson, E. and MacDonald, J. K. L. Stefan-like problems, 5346
Evans, H. D. *See* Belcher, E. H., 3590; Mugele, R. A., 8551
Evans, J. *See* George, E. P., 1169, 2816
Evans, J. C. and King, T. A. Five-inch molded silver chloride correctors for a Kellner–Schmidt system, 7657
Evans, M. G. A discussion on bond energies and bond lengths. Introduction, 7359. *See also* Bates, H. G. C., 2133; Brealey, G. J., 3147
Evans, M. G. and Uri, N. Photo-oxidation of water by ceric ions, 1433
Evans, R. D. *See* Davisson, C. M., 4674
Evans, R. L. Conductivities of strong electrolytes in aqueous solution, 4838
Evans, W. M. A discussion on detonation: some characteristics of detonation, 3122. *See also* Pack, D. C., 5138
Evans, W. M. and Pack, D. C. Penetration by high-velocity ("Munroe") jets. II, 5139
Evans, W. R., Jr. *See* Morgan, M. G., 7113
Evans, W. W. *See* Schremp, F. W., 6054
Everett, D. H. The thermodynamics of adsorption. II. Thermodynamics of monolayers of solids, 3159; III. Analysis and discussion of experimental data, 3160
Eveson, G. F., Whitmore, R. L. and Ward, S. G. Use of coaxial-cylinder viscometers and capillary-tube viscometers for suspensions, 2409
Evison, F. F. An electromechanical source of elastic waves in the ground, 5935
Evrard, L. The relative equilibrium of heterogeneous fluids in rotation: the problem of double-stars, 6705
Evstropev, K. S., Kuznetsov, A. Ya. and Melnikova, I. G. Electrical conductivity of lead glasses, 6212
Ewald, A. W. On the photo-conductivity of thallous sulfide cells, 4388. *See also* Gildart, L., 6967
Ewald, H. The masses of the substandards H^1, D^2, C^{12} and other light atoms, 8149
Ewels, J. *See* Henisch, H. K., 1055
Ewing, M. *See* Press, F., 6793
Extermann, C. R. *See* Lacroix, R. P., 2837
Extermann, R. *See* Lacroix, R., 1185, 7087; Ryter, C., 951, 7138
Extermann, R. C. *See* Béné, G. J., 539, 1967, 2915, 6384, 8897
Eyfrig, R. On the variations in *F*2 layer height, 7406. Influence of magnetic storms on the *F*2 region, 7408
Eyfrig, R., Harnischmacher, E. and Rawer, K. World-wide *F*2 ionization, 1536
Eyges, L. Effective photon energies of high energy photo-nuclear reactions, 5766
Eyges, L. and Fernbach, S. Angular and radial distributions of particles in cascade showers, 4506. Angular distributions of shower particles as a function of depth, 5528
Eyk, B. J. van. *See* van Eyk, B. J.
Eyring, H. *See also* Cagle, F. W., Jr, 6488; Cook, M. A., 6683; Kwoh, T.-C., 240; Mueller, C. R., 4866, 7170
Eyring, H., Colburn, C. B. and Zwolinski, B. J. The activated complex in chemisorption and catalysis, 1416
Eyring, H. and Gibbs, P. Nonclassical reaction kinetics, 4806

Fabbrichesi, L. *See* Belliboni, G., 8826
Fabelinskiĭ, I. L. *See* Velichkina, T. S., 2463

Fabre de la Ripelle, M. On an effect of internal recombination in β emission, 6427. Application of symbolic calculus to the solution of the perturbation method of Dirac, 7558

Fabri, J. *See* de Kármán, T., 2448

Facchini, U. *See also* Bracci, A., 2065; Colli, L., 1879

Facchini, U. and Gatti, E. Measurement of uranium fission cross-section with thermal neutrons, 622

Facchini, U., Gatti, E. and Germagnoli, E. The $Li^6(n, \alpha)H^3$ reaction spectrum, 4734. The energy spectrum of particles emitted in the reaction $^6_3Li(n, \alpha)^3_1H$, 4738

Faegri, K. On the value of palaeoclimatological evidence, 4945

Faegri, N. N. "Atmospheric turbulence" (disc.), 4929

Fahy, E. F. Investigations on large cosmic-ray bursts, 7051

Failla, G. and Rossi, H. H. Dosimetry of ionizing particles, 771

Fainberg, J. *See* Lord, J. J., 1316, 2810

Faĭnberg, Ya. B. *See* Akhiezer, A. I., 376–7

Fairbank, H. A. *See* Lynton, E. A., 265, 2630

Fairbank, J. *See* Bonnemay, M., 3860

Fairbrother, J. A. V. *See* Coutts, J. R. H., 7319

Fakidov, I. G. and Grazhdankina, N. P. Investigation of the specific heat of the ferromagnetic chromium sulphide, 2641

Falk, C. E. (*d*, *n*) Reactions with 15-Mev deuterons. I. Angular distributions, 8194

Falk, C. E. and Phillips, G. C. Excitation curve for the $H^3(p, \gamma)He^4$ reaction, 8961

Falk, C. E., Poss, H. L. and Yuan, L. C. L. Scintillating liquids as neutron detectors, 7036

Falkenhagen, H. and Jacob, H. Remarks on the theory of electrostriction in Onsager liquids, 5399

Falkoff, D. L. On the γ-γ-correlation with higher multipoles, 6436

Falk-Vairant, P. and Teillac, J. A study of the internal conversion radiation of ionium, 8951

Falla, L. On the theory of the phase-contrast microscope, 3475

Falloon, S. W. H. W. *See* Ramsey, J. A., 3423

Fallot, M. and Maroni, P. Paramagnetism of iron, cobalt and nickel ferrites, 6341

Faltings, V. *See also* Harteck, P., 3232

Faltings, V., Groth, W. and Harteck, P. Increase in the enrichment of gaseous isotopes in ultracentrifuges, 5681

Faltings, V. and Harteck, P. The tritium content of the atmosphere, 761

Fan, C.-Y. On the origin of the cosmic radiation, 414. On Fermi's theory of the origin of cosmic radiation, 4493. *See also* Sheline, R. K., 8914

Fan, H. Y. Temperature dependence of the energy gap in semiconductors, 6962. *See also* Johnson, V. A., 312

Fan, H. Y. and Becker, M. Semi-conducting materials. Infra-red optical properties of silicon and germanium, 7882

Fang, C. C. *See* Straumanis, M. E., 3078

Fankuchen, I. *See* Post, B., 5912; Wrightson, F. M., 4414

Fano, L. *See* Way, K., 2938

Fano, R. M. Short-time autocorrelation functions and power spectra, 18. The information theory point of view in speech communication, 1690

Fano, U. Note on quantum effects in optics, 4217. *See also* Goldstein, N., 4420; Spencer, L. V., 5449, 7929

Fano, U. and Taylor, L. S. Dosage units for high-energy radiation, 2725

Faraggi, H. An attempt to find evidence for the (n–α) reaction in iron caused by slow neutrons, 3779. Accurate measurement of the energy of heavy charged particles of small range by impregnation of photographic emulsions, 6269. *See also* Albouy, G., 9223; Curie, I., 5807

Faraggi, H. and Berthelot, A. The alpha-activity of natural bismuth, 8158

Faran, J. J., Jr. Sound scattering by solid cylinders and spheres, 6810

Faris, F. E. and Wright, B. T. Results of 12·4-Mev proton-proton scattering at 90°, 382

Farley, F. J. M. Clouds produced in an expansion chamber by ultra-violet light, 7041

Farmer, E. C. *See* Schorr, M. G., 4292

Farnell, G. C. High-intensity reciprocity failure of the internal image, 8415

Farnsworth, D. *See* Judd, D. B., 3243

Farnsworth, H. E. *See also* Sherburne, R. K., 5858

Farnsworth, H. E. and Lun, M. J. Secondary emission of nickel-barium mixtures and rhenium when bombarded by electrons with energies from 50 to 8 000 electron-volts, 2754

Faro, I. D. V., Small, T. R. and Hill, F. K. Hypersonic flow at a Mach number of 10, 2446

Farrar, R. T. *See* Liebson, S. H., 213

Fassel, V. A. and Anderson, C. H. Quantitative spectrographic analysis of zirconium-hafnium mixtures, 2152

Fastov, N. S. On the stationary creep rate, 2109. Contribution to the thermodynamics of plastic deformation, 9751

Fatehchand, R. Positive ion formation in air prior to high-frequency breakdown, 6233

Fatt, P. and Katz, B. Some observations on biological noise, 2238

Faul, H. *See also* Tittle, C. W., 3031

Faul, H. and Tittle, C. W. Logging of drill holes by the neutron, gamma method, and gamma ray scattering, 6617

Faulkner, F. C. *See* Shoemaker, F. C., 8964

Faure, R. First-order first-integrals in Dirac theory. The necessity of the operator $\partial/\partial t$ in time-dependent first-integrals. Forms of the first-integral operator, 6029. First integral of the first time-dependent order. Study of two particular cases. Significance of the matrices, α_1, α_2, α_3; the operator $(h/2\pi i)(\partial/\partial t)$ plays a role analogous to those of the operators $(h/2\pi i)(\partial/\partial qi)$, 6033. The correspondence between classical and wave mechanics, 6041

Faust, L. Y. Seismic velocity as a function of depth and geologic time, 6604

Faust, R. C. An interferometric study of some optical properties of evaporated silver films, 1763. Fresnel diffraction at a transparent lamina, 2582

Favorkin, V. N. Some characteristics of the secondary electron emission from potassium chloride films, 2750

Fawcett, S. L. and Crittenden, E. C., Jr. Ejection of the electron beam from a betatron, 2727

Fay, R. D. and Fortier, O. V. Transmission of sound through steel plates immersed in water, 5184

Feast, M. W. Two new $^2\Sigma$–$^2\Sigma$ systems due to the molecule NO, 946. On a band system ascribed to the CH molecule, 6843

Feather, N. The isomeric state of RaE, 6388

Feder, D. P. Optical calculations with automatic computing machinery, 8613

Fedorchenko, I. M. The problem of the intercrystalline matter and the texture of the grain boundaries in metals, 9011

Fedorov, E. K. Electric charges of the particles of precipitations, 9860

Fedorov, N. D. *See* Petrukhin, A. I., 387

Fedorov, V. L. *See* Kagan, Yu. M., 3540

Fedosow, J. Influence of solvent on Raman spectra of tetrahedral molecules, 2566

Feenberg, E. The excitation energy difference in Li^7–Be^7, 4747. *See also* Trigg, G., 7235

Feenberg, E. and Hammack, K. C. A note on Rainwater's spheroidal nuclear model, 4599

Feenberg, E. and Trigg, G. The interpretation of comparative half-lives in the Fermi theory of beta-decay, 2977

Feeney, H. *See* Kupperian, J. E., Jr, 4460

Fein, L. An ultrasonic underwater "point source" probe, 1679

Feingold, A. M. Table of *ft* values in beta-decay, 7209

Feinstein, J. The interpretation of radar echoes from meteor trails, 5987

Feinstein, J. and Sen, H. K. Radio wave generation by multistream charge interaction, 7112

Feldkeller, R. and Hettich, H. Frequency variation of magnetic after-effect in powder cores, 3632

Feldman, D. *See* Yang, C. N., 94

Feldman, L. *See* Wu, C. S., 6428

Feng, I.-M. Applications of polystyrene particles in conjunction with shadow casting to the study of polished metallic surfaces, 6501

U OF I
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Fensham, P. J. Self-diffusion in tin crystals, 1339; Corrigenda, 9013: Self-diffusion in polycrystalline tin, 1340
Feofilov, P. P. *See* Gurevich, D. B., 6225, 6885
Ferber, J. A. The motion of metallic test particles of order of magnitude 10^{-4} to 10^{-5} cm. in the homogenous magnetic field from a permanent magnet, under intermittent illumination, 511
Fergus, D. *See* Levy, G. B., 241
Ferguson, E. E. *See* Schriever, W., 5864
Ferguson, W. F. C. *See* Greig, J. H., 236
Ferigle, S. M. and Meister, A. G. Kinetic energy matrix for linear molecules, 8097
Fermi, E. An hypothesis on the origin of the cosmic radiation, 416. High energy nuclear events, 3336. Angular distribution of the pions produced in high energy nuclear collisions, 4751
Fernandez, C. *See* Davis, H., 8396
Fernando, I. and Krishnamurty, S. G. The spectrum of doubly ionised tantalum, 7669
Fernbach, S. Radial distribution of shower electrons as a function of depth, 5529. *See also* Eyges, L., 4506, 5528
Fernbach, S., Green, T. A. and Watson, K. M. Scattering of π-mesons by deuterium, 7291
Ferreira, R. de Carvalho. *See* de Carvalho Ferreíra, R.
Ferrell, O. P. Enhanced trans-equatorial propagation following geomagnetic storms, 7407
Ferretti, B. On the nature of the π-meson, 632. Further considerations on Dyson and Feynman's $S(\sigma)$-operator, 1620. On the problem of the eigenvalues of the energy for closed systems in field theories, 1621. On the diagonalization of the Hamiltonian in the theory of wavefields, and on the theory of closed systems. I, 4091
Ferro, A. and Montalenti, G. Internal friction of ferromagnetic materials, 5625
Ferry, J. D. *See also* Schremp, F. W., 6054
Ferry, J. D., Fitzgerald, E. R., Johnson, M. F. and Grandine, L. D., Jr. Mechanical properties of substances of high molecular weight. X. The relaxation distribution function in polyisobutylene and its solutions, 6055
Fert, C. A demonstration apparatus for electron optics, 7936. *See also* Dessens, H., 4789
Fert, C. and Gautier, P. Inductive method for investigating the topography of the field on the axis of a strong magnetic lens, 9586
Fesenko, E. G. *See* Belyaev, I. N., 9807
Fesenkov, V. G. Gaseous tail of the earth, 28, 3233. The zodiacal light and the outer atmosphere of the Earth, 5020
Feshbach, H. *See* Harris, C. M., 167; Lax, M., 3772; Pease, R. L., 3697
Fessler, H. Marco resin as a photo-elastic model material, 100
Fessler, J. H. and Ogston, A. G. Studies of the sedimentation, diffusion and viscosity of some sarcosine polymers in aqueous solution, 9098
Festa, C. On the initial abundance of K^{40}, 3960
Festa, C. and Santangelo, M. On the decay of K^{40}, 1990. A method of determining the age of the earth, 3226
Feynman, R. P. Mathematical formulation of the quantum theory of electromagnetic interaction, 1601. An operator calculus having applications in quantum electrodynamics, 9268
Fialkovskaya, O. V. Absorption spectra of $Nd(NO_3)_3$ in various binary solvents, 2530
Fichtenholz, I. G. *See* Fikhtengolts, I. G.
Fickeissen, O. O. *See* Aslakson, C. L., 3307
Ficquelmont, A. M. de. *See* de Ficquelmont, A. M.
Fidecaro, G. *See* Amaldi, E., 639–40, 839, 4756
Fidelman, D. Synthetic reverberation, 1708
Fiebich, M. A contribution to the determination of the electron density in a gas discharge at low pressure, 3549
Field, F. H. A new calculation of the latent heat of sublimation of carbon and the first C–H dissociation energy in methylene from electron impact data, 6934
Field, J. E., Cole, J. O. and Woodford, D. E. Infrared data on epoxy structures, 949
Field, J. E. and Gehman, S. D. A noncontact temperature measuring device, 2637
Fieldes, M. and Hartman, L. Solidification curves and crystal spacings of binary fatty-acid mixtures, 8364
Fields, P. R. *See* Huizenga, J. R., 6462
Fields, R. E. and Walt, M. Total neutron cross-sections of magnesium and silicon, 8981
Fierz, M. On the meaning of the D_c-function in the quantum theory of wave-fields, 2373
Fieschi, R. *See* Caldirola, P., 9574
Fikhtengolts, I. G. The problem of two finite bodies in the second approximation to the gravitation theory of Einstein, 7574
Filosofo, I. *See* Bassi, P., 474, 8815
Finch, G. I. The boundary layer, 3836
Finch, G. I. and Layton, D. N. The crystal structure of metallic electrodeposits, 5821
Finch, G. I. and Spurr, R. T. Surface welding and the extreme pressure lubricant, 3847
Finch, L. G. Residual strains in plastically deformed mild steels, 678
Fineman, M. A. *See* Wallace, W. E., 3109
Fink, R. M. A new approach to high resolution radioautography, 9897
Finkelnburg, W. Conditions for blackbody radiation by solids and gases, 7652
Finkelnburg, W. and Segal, S. M. High temperature plasma properties from high current arc stream measurements, 1072. The potential field in and around a gas discharge, and its influence on the discharge mechanism, 7923
Finkelnburg, W. and Stein, A. Cerium oxyfluoride and its lattice structure, 1505
Finkelshteĭn, B. N. *See* Borgardt, A. A., 6193
Finkelstein, A. Energy transfers between active nitrogen and sodium, potassium and antimony, 1435
Finkelstein, B. N. *See* Finkelshteĭn, B. N.
Finkelstein, N. A. An efficient grating mount, 5325
Finkelstein, R., LeLevier, R. and Ruderman, M. Nonlinear spinor fields, 6742
Finlay, E. A., Fowler, J. F. and Smee, J. F. Field measurements on model betatron and synchrotron magnets, 381
Finn, G. B., LaBerge, W. B. and Coomes, E. A. Periodic deviations in the Schottky effect for polished tantalum, 4489
Finogenov, P. A. Thermostatic temperature control of an accuracy of ± 0·005°c obtained by simple means, 1812. On the measurement of the constant of the diffusion of polymers, 9099
Finzi, B. Einstein's new unified relativistic theory, 62
Fiorentini, A. The resolution of double stars, 769. The resolution of double stars from the point of view of energy, 9872
Fireman, E. L. and McHaney, G. M. A self-triggering cloud-chamber counter, 1886
Fischbein, I. W. Electron microscopy of wet biological tissues by replica techniques, 1358
Fischer, E. Association of dipolar molecules in liquids and solutions from measurements of the dielectric relaxation period, 2430. The stereochemistry of the imidazolidine ring, 4870. Dielectric polarization and relaxation of solutions and mixtures of polar (including associated) materials with the assumption of the Onsager inner field, 9440
Fischer, J. Definition of magnetic units, 1171
Fischer, O. F. Universal mechanics and Hamilton's quaternions, 9288
Fisher, E. Partition functions of cubic lattices, 5631
Fisher, I. Z. On the gravitational field of magnetic moments, 8437
Fisher, J. C. The limiting hydrostatic tension of water near 0°c, 106. Calculation of diffusion penetration curves for surface and grain boundary diffusion, 3063
Fisher, L. H. On the representation of the static polarization of rigid dielectrics by equivalent charge distributions, 4364
Fisher, L. H. and Bederson, B. Formative time lags of spark breakdown in air in uniform fields at low overvoltages, 2716
Fisher, R. M. and Miller, D. S. A simple automatic recording microphotometer, 2497
Fishkova, L. M. On the temperature-dependence of the intensity of lines in the combination scattering [Raman] spectra of some liquids, 3460
Fitzgerald, E. R. *See* Ferry, J. D., 6055

Fitzgerald, J. V. *See* Laing, K. M., 7651

Fitzpatrick, J. A., Hubbard, J. C. and Thaler, W. J. A high intensity short duration spark light source, 1859

Flack, F. C. *See* Eichholz, G. G., 4772

Flaig, W. and Beutelspacher, H. Electron microscopic investigations in soil science, 3807

Flamant, F. *See* Arnulf, A., 4966–7

Flammersfeld, A. and Ythier, C. A new selenium nuclear isomer of $\frac{1}{2}$ life $3\cdot9$ min, 576

Flanagan, J. L. Effect of delay distortion upon the intelligibility and quality of speech, 5218

Flanders, D. A. and Shortley, G. Numerical determination of fundamental modes, 780

Fleeman, J. and Dienes, G. J. On the Fredrickson–Eyring theory of the mechanical behaviour of metals, 2106

Flegler, E. Oxide ferromagnetic materials, 2833

Fleischmann, R. Interference method for the measurement of the absolute phases in the study of absorbing media, 5310. The structure of the system of physical concepts, 6720. *See also* Dornenburg, G., 5312

Fleischmann, R. and Schopper, H. The determination of optical constants and film thickness of absorbing layers by means of measuring absolute phase changes, 5311

Fleming, E. H., Jr, Ghiorso, A. and Cunningham, B. B. The specific alpha-activity of U^{235}, 7207

Fleming, F. W. and Binder, R. C. Study of linear-resistance flowmeters, 7619

Fletcher, W. H. *See* Crawford, B. L., Jr, 4027, 4281

Flett, M. St. C. The characteristic infra-red frequencies of the carboxylic acid group, 5275

Flinn, P. A. and Averbach, B. L. Atomic arrangements in gold-nickel solid solutions, 9736

Flint, H. T. and Williamson, E. M. The quantum mechanics of the electron, 6734

Flint, R. F. Dating late-pleistocene events by means of radiocarbon, 6619

Florence, J. M., Allshouse, C. C., Glaze, F. W. and Hahner, C. H. Absorption of near-infrared energy by certain glasses, 1761

Flory, P. J. *See* Mandelkern, L., 7602

Flowers, B. H. The theory of the T + D reaction, 1622

Flowers, B. H. and Mandl, F. Photodisintegration of the alpha-particle and the inverse processes, 3769

Floyd, J. J. *See* Sailor, V. L., 7215

Fluharty, R. G. *See* Roberts, B. W., Jr, 1133

Flum, R. S. *See* Thompson, R. W., 7992

Flynn, T. *See* Reich, H. J., 7890

Fochs, P. D. A method of determining concurrently the thickness and refractive index of a thin film or lamina, 989

Foëx, G. Large negative molecular fields; various mechanisms of the transition between antiferromagnetism and Weiss paramagnetism, 6312

Foëx, G. and Wucher, J. Antiferromagnetism and structure of Cr_2O_3, 8025

Fogel, K.-G. On the pseudoscalar symmetrical meson theory of nuclear forces, 2381

Fogel, Ya. M. On the motion of particles with magnetic moment in an exponential magnetic field, 5802. *See also* Korsunskiĭ, M. I., 5801

Fok, V. A. Generalization of the reflection formulae to the case of reflection of a wave of arbitrary form on a surface of arbitrary form, 6823

Foldy, L. L. Diffusion of high energy gamma-rays through matter. I. Fundamental equations, 4672. III. Refinement of the solution of the diffusion equation, 7241. A note on atomic binding energies, 7194. The electron-neutron interaction, 7534. *See also* Milford, F. J., 2783; Osborn, R. K., 85; Sachs, R. G., 2988

Foldy, L. L. and Milford, F. J. On the deviation of nuclear magnetic moments from the Schmidt limits, 2914

Foldy, L. L. and Osborn, R. K. Diffusion of high energy gamma-rays through matter. II. Solution of the diffusion equation, 4673

Foley, H. M. Nuclear moment discrepancies in gallium and indium, 1977

Foley, W. T. and Giguére, P. A. Radioactive tracers in solid solution investigations, 8243

Fonberg, Z. Evidence of nuclear transmutation in the course of explosion of shaped charges with lined cavity, 5735

Foner, S. *See* Pugh, E. M., 4990

Font-Altaba, M. Structural crystallographic constants of saccharin and its Mn^{++}, Ni^{++} and Co^{++} derivatives, 8361. *See also* Amorós, J. L., 9818

Foord, T. R. Positive point-to-plane spark breakdown of compressed gases, 1082

Foote, J. R. and Lin, C. C. Some recent investigations in the theory of hydrodynamic stability, 3366

Föppl, O. Defects of accepted elasticity theory, 8255

Ford, K. W. and Bohm, D. Nuclear size resonances, 1232

Ford, L. H. *See* Rayner, G. H., 6191

Foreman, A. J., Jaswon, M. A. and Wood, J. K. Factors controlling dislocation widths, 3091

Forestier, H. and Kiehl, J.-P. Influence of gas adsorption on polymorphic transformations, 716

Forestier, H. and Maurer, J. Effect of the adsorption of gases on the fusion of crystallized bodies, 6544

Forman, G. A study of color centers produced in quartz by X-radiation, 6558

Forman, R. and Rouse, G. F. Oxide cathode base metal studies, 3600

Fornaseri, M. Structure of tetrogonal metaborates and their crystal chemical relationships, 9156

Forneris, R. *See* Stammreich, H., 1758

Forrer, R. Calculation of the Curie constant of ferromagnetics and paramagnetics based on the concept of intermitted activation, 1919. Progressive intermittent activation in some ferromagnetic alloy systems, 2820. The origin of intermittent activation in ferromagnetics, 6316. New concept of the electronic state in ferromagnetics. Introduction of the idea of intermittent activation, 7065

Forrester, A. T. and Mittenthal, L. Small angle diffraction of light by a glass cube, 3466

Forrester, J. W. Digital information storage in three dimensions using magnetic cores, 2302

Forro, M. *See* Barnóthy, J., 8159

Forsbergh, P. W., Jr. Domain structures and phase transitions in barium titanate, 8711

Forster, M. J. and Mead, D. J. Electrical properties of some carbon black-oil suspensions, 6219

Försterling, K. and Wüster, H. O. On the origin of harmonics at points in the ionosphere where the dielectric constant becomes zero, 1204. On reflection in homogeneous media, 4555

Fortescue, R. L. High voltage direct current generators for nuclear research, 9535

Fortier, O. V. *See* Fay, R. D., 5184

Fortmiller, L., James, T. H., Quirk, R. F. and Vanselow, W. The combined effect of infra-red radiation and intensification upon the photographic latent image, 1554

Fortrat, M. Free oscillations and discharge oscillations, 3405

Fortuin, G. J. Visual power and visibility, 9871

Forty, A. J. Observation of growth of cadmium iodide from aqueous solution, 9125

Forziati, F. H. and Rowan, J. W. Effect of changes in crystalline structure on the infrared absorption spectrum of cellulose, 3441

Foss, H. and Vegard, L. Continued investigations on the excitation functions of nitrogen bands, 4954

Foss, M., Fox, J. G., Sutton, R. B. and Creutz, E. C. Design of a cyclotron magnet. I. Pole design using a half-magnet, 8049

Foster, A. G. Sorption hysteresis. I. Some factors determining the size of the hysteresis loop, 9085

Foster, E. W. Nuclear effects in atomic spectra, 7677. Hyperfine structure in the $5d^96p$ and $5d^86s^2$ configurations of the spectrum of Hg iii, 7681

Foster, F. G. *See* Williams, H. J., 7137

Fouché, M. Frequency stabilization, 7625

Fourès-Bruhat, Y. Existence and uniqueness theorems for the equations of the Jordan–Thiry unified theory, 7506

Fouret, R. Centring the cathode in a demountable X-ray tube, 7003

Fournet, G. Theory of order-disorder modifications in binary alloys, 3909. Generalization of Born and Green's kinetic theory of fluids to apply to collections of particles of several different kinds, 8763. Scattering of X-rays by fluids, 8764

Fournet, G. and Guinier, A. The present state of the theory of low-angle scattering of X-rays, 1087

Fournier, M. Influence of the frequency of the applied voltage at a mercury dropping electrode. Study of the polarographic curves, 6552

Fournier, M. and Quintin, M. Influence of the frequency of the applied voltage at a dropping mercury electrode. Study of the cathodic oscillograph, 4881

Fowler, C. M. and Shreffler, R. G. The design of a magnetic focusing coincidence spectrometer, 367

Fowler, F. E. and Johnson, D. S. Servo guider for solar telescopes, 5980

Fowler, I. L. and Tunnicliffe, P. R. Boron trifluoride proportional counters, 384

Fowler, J. F. *See* Finlay, E. A., 381

Fowler, J. L. *See* Brolley, J. E., Jr, 4742, 5758

Fowler, L. *See* Noyes, R. M., 9069

Fowler, P. H. *See also* Dainton, A. D., 5532

Fowler, P. H., Menon, M. G. K., Powell, C. F. and Rochat, O. Masses and modes of decay of heavy mesons. II. τ-particles, 9722

Fowler, R. G. *See also* Lee, R. J., 4406

Fowler, R. G., Goldstein, J. S. and Clotfelter, B. E. Luminous fronts in pulsed gas discharges, 6992

Fowler, W. A. *See* Brown, A. B., 4710; Hornyak, W. F., 2911; Li, C. W., 8152; Snyder, C. W., 1115

Fox, H. W. and Zisman, W. A. The spreading of liquids in low energy surfaces. I. Polytetrafluoroethylene, 3380

Fox, L. L., Palmer, P. L. and Whittaker, D. A compensating circuit for the Simmons shielded hot-wire anemometer, 895

Fox, J. C. *See* Foss, M., 8049

Fox, P. A. *See* Carrus, P. A., 3300, 6714

Fox, R., Leith, C., Wouters, L. and MacKenzie, K. R. Total cross sections of nuclei for 280-Mev neutrons, 1329

Fradkina, E. M. Electrical parameters of disperse systems, 6951

Fragstein, C. v. *See* v. Fragstein, C.

Frampton, V. L. and Harwell, K. E. Coordinate system for electrophoresis, 7911

Franchetti, S. and Giovannozzi, M. Angular spreading of showers in heavy material, 7996

Francia, G. Toraldo Di. *See* Toraldo di Francia, G.

Francis, G. and von Engel, A. Development of the low pressure electrodeless discharge in a high-frequency electric field, 347

Francis, J. E., Jr, Bell, P. R. and Gundlach, J. O. Single-channel analyzer, 4477

Francis, J. R. D. "Atmospheric turbulence" (disc.), 4929. The aerodynamic drag of a free water surface, 5167

Francis, S. A. Intensities of bands due to free and bonded hydroxyl groups in the 3-micron region, 5278. Intensities of some characteristic infrared bands of ketones and esters, 6863

Franck, J. K. Method of testing and evaluating fluorescent luminaires, 2495

François, M. *See* Henisch, H. K., 7886; van Itterbeek, A., 4779

Françon, M. Spherical and chromatic aberration and visual solving power, 4968. *See also* Camus, A.-M., 5324

Françon, M. and Nomarski, G. Phase contrast units using an ordinary microscope, 3472

Frank, C. and van Heel, A. C. S. Precision alignment in daylight, 5340

Frank, F. C. Lattice sums for ionic crystals, 3195. Crystal dislocations. Elementary concepts and definitions, 8345. The growth of carborundum: dislocations and polytypism, 9811. *See also* Burton, W. K., 6560; Eshelby, J. D., 5827

Frank, F. C. and Oliver, D. S. A simple goniograph, 8333

Frank, F. C. and Read, W. T., Jr. Multiplication processes for slow moving dislocations, 673

Frank, R. M. The fourth-order contribution to the self-energy of the electron, 8517

Frank, S. G. F. A localizing Geiger counter, 7029

Frank, S. G. F., Frisch, O. R. and Scarrott, G. G. A mechanical kick-sorter (pulse size analyser), 7975

Frank-Kamenetskiĭ, D. A. The vibration stability and autovibration of stars, 6004

Franke, O. The systems and units of dimensions of electric and magnetic quantities, 8492

Frankel, S. The effect of scattering on angular correlation measurements, 8913

Frankl, E. K. Summarised proceedings of a conference on stress analysis, London, 1950 (conf. rep.), 100

Franklin, E. *See also* Peirson, D. H., 9844

Franklin, E. and Loosemore, W. R. A survey equipment using low-voltage halogen-quenched Geiger–Müller counters, 4467

Franklin, J. L. and Lumpkin, H. E. Lack of resonance energy in gaseous carbonium ions, 8882

Franklin, R. E. The structure of graphitic carbons. 6580. Crystallite growth in graphitizing and non-graphitizing carbons, 9814

Franklin, R. G. *See* Agnew, J. T., 4240

Fränz, H. and Westmeyer, H. The disintegration of boron by slow neutrons, 3776

Franz, W. The theory of diffraction by a screen, 993. The mechanism of electric breakdown in solid dielectrics, 6249

Franzen, W. and Horton, J. A reliable Pirani vacuum safety circuit, 2438

Franzen, W., Peelle, R. W. and Sherr, R. The measurement of proton energies with scintillation counters, 391

Franzinetti, C. and Rosenblum, S. On the spectrum of light particles produced in cosmic ray disintegration, 462

Fraser, R. D. B. Infra-red microspectrometry with a 0·8 N.A. reflecting microscope, 7666. *See also* Price, W. C., 7749

Frauenfelder, H. Influence of the atomic shell on nuclear angular correlation, 6444. *See also* Aeppli, H., 6445

Frauenfelder, H., Huber, O., de-Shalit, A. and Zünti, W. Decay of Hg^{197}, 1272

Fraunberger, F. A geometrical representation of spectrum line series, 6835

Frazer, A. R. The condensation of a perfect Bose–Einstein gas. I, 2398; II, 2399

Fréchet, M. Generalizations of Laplace's probability law, 5978

Fred, M. *See also* Tomkins, F. S., 8622

Fred, M., Tomkins, F. S., Brody, J. K. and Hamermesh, M. The spectrum of He^{3}I, 5251

Freedman, A. J. and Hume, D. N. A precision method of counting radioactive liquid samples, 1261

Freedman, L. A. and Rosenthal, L. A. An apparatus for the study of electrets, 2659

Freedman, M. *See* Smaller, B., 218. *See also* Ramler, W. J., 1127, 2766

Freedman, M. S. and Engelkemeir, D. W. The radiations of Ce^{141} and Pa^{233}, 571

Freeman, B. E. *See* Bloch, I., 2391, 9687

Freeman, G. P. and van der Velden, H. A. Some aspects of the counting properties of diamond, 8795

Freeman, J. M. The emission of short range alpha particles from light elements under proton bombardment. IV. The reaction $^{19}F(p\alpha)^{16}O^*$, 2037

Freeman, J. M. and Burcham, W. E. The range-energy relation for slow alpha-particles in air, 5709

Freeman, J. M. and Seed, J. Alpha-particles form the proton bombardment of phosphorus, 4704

Freeman, J. R. *See* Collins, C. B., 7400

Freeman, R. F. J. *See* Bawn, C. E. H., 4871–2

Frei, E. H. and Hirshfeld, F. L. An exposure meter for the electron microscope, 4437

Freiberger, W. On the solution of the equilibrium equations of elasticity in general curvilinear coordinates, 101

Freier, G. D. *See also* Claassen, R. S., 5481; Lampi, E. E., 3030

Freier, G. D., Stratton, T. F. and Rosen, L. The excited nuclear state of Be^7, 605

Freiesleben, H. C. Remarks on the definition of time and the significance of the annual rate of quartz clocks, 5060

Fremlin, J. H. and Gooden, J. S. Particle accelerators requiring magnetic fields, 380

Fremlin, J. H. and Walters, M. C. Background tracks in electron-sensitive nuclear emulsions, 468

French, A. P. Matrix elements for octupole radiative transitions, 4678

French, A. P. and Seidl, F. G. P. The energy loss of slow deuterons in heavy ice, 5483
French, A. P. and Thompson, D. M. The reaction ^{23}Na(d,α)^{21}Ne, 3765
French, A. P. and Treacy, P. B. The reaction ^{7}Li(d, α) and the ground state of ^{5}He, 6456
French, C. M. and Trew, V. C. The diamagnetic susceptibility of some substituted ethyl malonates, 8847
French, R. S. Plasticity and conductivity, analogous flow phenomena in copper alloys, 3098
Frenkel, Ya. I. *See* Gindin, L. G., 2721, 3550, 6248
Fréon, A. The interpretation of coincidences between counters encased within a block of lead: showers of penetrating particles incident from the air or local effects originating in the lead, 2807
Fréon, A. and Tsaï-Chu. The empirical zenith-angle distribution of the hard component in the lower atmosphere, 445. Origin of Rossi showers under thick screens of heavy material, 1159
Fretter, W. B. Penetrating showers from lithium, 3609. The angular distribution of V^0-particle decay products, 9579
Freudenthal, H. *See* Bosschart, R. A. J., 6815
Freund, K. *See* Crandell, F. F., 8666
Frevel, L. K. and Anderson, H. C. Powder diffraction patterns from micro samples, 3915
Frevel, L. K. and North, P. P. Single wave-length X-rays for powder diffraction, 360
Frey, A. R. *See* Kinsler, L. E., 4180
Frey, H. B., Grim, W. M., Preston, W. M. and Gray, T. S. Response of an anthracene scintillation counter to protons, 5498
Freymann, M. and Freymann, R. Absorption in the ultrahertzian region and the hydroxyl bond: water of crystallisation and water of adsorption, 3513. Influence of temperature upon ultra-Hertzian absorption by water of crystallization and water of adsorption. (Liquid state of adsorbed water up to − 90°c), 5613
Freymann, M., Rolland, M.-T. and Freymann, R. Ultra-Hertzian absorption of alums and ammonium sulphate and the spectral representation log ν_c–T, 7702
Freymann, R. Centrimetric waves and molecular structure, 1471. Remark on the rotational method and the method of perturbations in the ultra-Hertzian region. Apparatus for measuring the absorption of vapours for frequencies near 10 000 Mc/s, 7701. *See also* Freymann, M., 3513, 5613, 7702. *See also* Rohmer, R., 953
Freymark, H. A new ultraviolet band system of the C_2 molecule, 6115
Friant, D. R. *See* Gunder, D. F., 103, 6051
Fricke, H. *See* Cario, G., 9409
Fricke, R. *See* Hund, F., 1212
Fricke, W. A sensitometer for the calibration of photographic images of extended objects during exposure, 926. *See also* Heckman, O., 4076
Fridberg, I. D. *See* Bogoroditskiĭ, N. P., 7842
Fridge, D. L. *See* Coleman, H. S., 4325
Fried, S., Jaffey, A. H., Hall, N. F. and Glendenin, L. E. Half-life of the long-lived Tc^{99}, 4639
Friedburg, H. and Paul, W. Optical representation with neutral atoms, 7287
Friedel, R. A. *See* Anderson, R. B., 4819
Friedland, S. S. Energy distribution of fission fragments of U^{235} produced by 2·5-MeV and 14-MeV neutrons, 9713
Friedlander, G. On the half-plane diffraction problem, 9399. *See also* Alburger, D. E., 4676, 7226; Perlman, M. L., 5705*
Friedlander, G., Perlman, M. L., Alburger, D. and Sunyar, A. W. Measurement of absolute electron capture rates with an application to the decay of Ni^{57}, 1274
Friedlander, G., Perlman, M. L. and Scharff-Goldhaber, G. Conversion coefficient of the 35-keV gamma-ray of Te^{125}, 2984
Friedman, A. S. *See also* White, D., 256
Friedman, A. S. and White, D. The vapor pressure of liquid nitrogen, 257
Friedman, A. S., White, D. and Johnston, H. L. Critical constants, boiling points, triple point constants and vapor pressures of the six isotopic hydrogen molecules, based on a simple mass relationship, 4333
Friedman, B. Amplification of the travelling wave tube, 4552
Friedman, H., Lichtman, S. W. and Byram, E. T. Photon counter measurements of solar X-rays and extreme ultraviolet light, 9202
Friedman, H. L. and Rainwater, J. Experimental search for the beta-decay of the π^+ meson, 4750
Friedman, L. *See also* Bigeleisen, J., 2540. Reiss, H., 5848
Friedman, L. and Bigeleisen, J. Oxygen and nitrogen isotope effects in the decomposition of ammonium nitrate, 1396
Friedmann, M. D. Determination of eigenvalues using a generalized Laplace transform, 781
Friesen, S. von. *See* von Friesen, S.
Frilley, M., Gokhale, B. G. and Valadares, M. Crystalline diffraction spectrography of the electromagnetic radiation of RaD, 3744. *L*-spectrum emitted in the transmutation RaD → RaE, 3745
Fringant, A.-M. *See* Berger, J., 6706, 7483, 7494
Frisby, J. H. and Roaf, D. Quantitive measurement of samples of tritium, 3718
Frisch, O. R. *See* Frank, S. G. F., 7975
Frishman, I. G. *See* Rodionov, S. F. 8472
Frisman, E. and Kiseleva, K. Investigation of the scattering of light solutions of polymers, 2587
Fristrom, R. M. *See* Baird, D. H., 937
Fritsch, V. Some geoelectric investigations on Austrian glaciers, 3963
Fritz, J. J., Gonzalez, O. D. and Johnston, H. L. Magnetic moments and eddy currents in spheres of superconducting tin, 2706
Fritz, S. and MacDonald, T. H. Measurements of absorption of solar radiation by clouds, 9211
Fritze, C. and Simonson, E. A new electronic apparatus for the measurement of the fusion frequency of flicker, 8391
Fröberg, C.-E. On the solution of ordinary differential equations with digital computing machines, 786. On the determination of the *P-P* interaction from scattering experiments, 856. On determination of proton-proton interaction from scattering experiments, 5100
Fröhlich, H. Theory of the superconducting state. I. The ground state at the absolute zero of temperature, 325; II. Magnetic properties at the absolute zero of temperature, 2704. Theoretical aspects of superconductivity. Crystal structure and superconductivity. Superconductivity and effective mass of electrons, 9492–3
Frohnmeyer, G. The scatter of diffraction spots on X-ray back-reflection photographs, 9134
Frohnmeyer, G. and Glocker, R. Diffraction spots on X-ray back-reflection photographs, 6571
Froman, D. K. *See* Allred, J. C., 8190
Fröman, P. O. *See* Lundqvist, S. O., 1959
Froome, K. D. *See* Essen, L., 5616
Froslie, H. M. *See* Phillips, B. B., 4266
Frost, A. A. and Braunstein, J. Hydrogen molecule energy calculation by correlated molecular orbitals, 8879
Frueh, J., Jr. Confirmation of the structure of chromium boride, CrB, 2177
Fruhling, A. Investigations of the Raman spectrum of some aromatic monocrystals, 7770
Fry, D. L. *See* Mansfield, W. O., Jr, 6556
Fry, D. W., Dain, J., Watson, H. H. H. and Payne, H. E. The design and operation of a 30-MeV synchrotron, 1094
Fry, E. J. An ultrasonic projector design for a wide range of research applications, 2471. *See also* Fry, W. J., 1684, 5189
Fry, R. B. *See also* Fry, W. J., 4199
Fry, R. B. and Fry, W. J. Crystal systems with low loss, 2849
Fry, T. M. *See* Berman, R., 1793
Fry, W. F. Low energy electrons at the end of μ-meson tracks, 637. Ratio of negative to positive π-mesons in the stratosphere, 6301. The capture and decay of mesons in photographic emulsions, 8222
Fry, W. J. *See also* Fry, R. B., 2849; Hall, W. L., 4201

Fry, W. J., Fry, R. B. and Hall, W. L. Variable resonant frequency crystal systems, 4199
Fry, W. J., Tucker, D., Fry, F. J., and Wulff, V. J. Physical factors involved in ultrasonically induced changes in living systems. II. Amplitude duration relations and the effect of hydrostatic pressure for nerve tissue, 5189
Fry, W. J., Wulff, V. J., Tucker, D. and Fry, F. J. Physical factors involved in ultrasonically induced changes in living systems. I. Identification of non-temperature effects, 1684
Frye, G. M. and Wiedenbeck, M. L. Magnetic analysis of the B(α,p)C reaction, 7256
Frye, W. E. On the accuracy of the long-range ballistic rocket, 5137
Fu, Y. and Bartell, F. E. Surface area of porous adsorbents, 8999
Fuchs, J. The effective speed of transmission of short radio waves. 8854
Fucks, W. Considerations of reaction and the similarity principle in the initiation of gaseous electrical discharges, 2713
Fues, E. and Wagner, E. H. On the structure of the streaks in the Kossel–Möllenstedt electron interference patterns with a convergent beam. I, 5929; II, 6600
Fuhrmeister, J. C. *See* Mansfield, W. O., Jr, 6556
Fujimoto, M. *See also* Itoh, J., 8844
Fujimoto, M. and Itoh, J. Microwave paramagnetic resonance spectrum, 7092
Fujimoto, Y. *See also* Aidzu, K., 5120, 8198
Fujimoto, Y., Fukuda, H., Hayakawa, S. and Yamaguchi, Y. On the production of cosmic ray mesons, 5537
Fujimoto, Y. and Hayakawa, S. Nuclear disintegration caused by cosmic-rays, 7254
Fujimoto, Y. and Miyazawa, H. Photo-meson production and nucleon isobar, 5797
Fujimoto, Y., Nishina, K., Okabayashi, T., Takayanagi, K. and Yamaguchi, Y. Effect of nuclear binding on meson production, 5118
Fujimoto, Y., Takayanagi, K. and Yamaguchi, Y. The fast protons in π-meson stars, 636
Fujimoto, Y. and Yamaguchi, Y. High energy nuclear evaporation, 5538. Mesonic processes in two-nucleon system, 7545
Fujioka, G., Kita, I. and Minakawa, O. On the temperature effect of Geiger–Müller counters, 5490. On the analysis of [Johnson's] quenching circuit for slow counters, 5499
Fujisaki, Y. and Yamamura, H. The composition limit of flame propagation. II, 1014
Fujisawa, S. and Mizuki, E. A note on intermediate intensity reciprocity-law failure at and near the optimum in photographic exposure, 8413
Fujita, H. *See* Katsura, S., 5133, 6924
Fukada, E. The vibrational properties of wood, 2090
Fukuda, H. *See also* Aidzu, K., 5120, 8198; Fujimoto, Y., 5537; Nakumura, S., 5115
Fukuda, H. and Hayakawa, S. On the decay of a heavy Dirac meson, 5796
Fukuda, H., Hayakawa, S. and Miyamoto, Y. On the nature of τ mesons. II, 3045
Fukuda, H. and Kinoshita, T. Ambiguities in quantized field theories, 5084
Fukuda, H. and Takeda, G. Production of π-mesons in nucleon-nucleon collisions near the threshold energy, 5116. The multiple production of mesons by high energy nucleon collisions, 5121
Fukuda, N. and Miyazima, T. The covariant theory of radiation damping. I. General formalism, 5094
Fukuroi, T. and Shibuya, Y. The measurement of the Young's modulus of metals and alloys by an interferometric method. I. The Young's modulus of Ni–Cu alloys, 8261
Fukuroi, T., Tanuma, S. and Tobisawa, S. On the electromagnetic properties of single crystals of tellurium. I. Electrical resistance, Hall effect, magneto-resistance, and thermo-electric power, 3526; II. Ettingshausen–Nernst effect, 4565; III. Adiabatic and isothermal Hall effect, and Ettingshausen effect, 4566. Electric resistance, Hall effect, magneto-resistance and Seebeck effect in a pure tellurium film, 6218
Fukushima, N. *See* Nagata, T., 6632
Fulbright, H. W. and Milton, J. C. D. The beta-spectrum of Cl^{36}, 6425
Fuller, D. L. *See* Davidson, H. R., 6937
Fuller, E. W. A coincidence absorption study of the decay of ^{181}Hf, 2004
Fullman, R. L. Formation of annealing twins during grain growth, 2159. Interfacial free energy of coherent twin boundaries in copper, 4776. Crystallography and interfacial free energy of noncoherent twin boundaries in copper, 4777
Fulton, A. S. *See* Bennett, R. R., 9458
Fultz, D. Experimental studies of a polar vortex. I, 2209
Fumi, F. G. On the form of molecular orbitals in conjugated rings and chains, 4576
Funatogawa, Z. The change in thermal e.m.f. produced by magnetization of a single crystal of iron, 1854
Fundaminsky, A. *See* Bates, D. R., 1890
Funder, L. Measurement of atmospheric electricity in mines, 2230
Fünfer, E. and Neuret, H. "Giant" pulses in vapour filled counters, 2762
Funk, P. On Newton's image relationship in electron optics, 5454
Funshtein, B. L. *See* Nemilov, Yu. A., 610
Furberg, S. X-ray crystallographic data on the mandelic acids, 5928
Furman, A. M. *See* Ismaĭlov, S. V., 7017
Furman, N. H. Potentiometric titrations, 3886. *See also* Reilley, C. N., 9112
Furman, N. H. and Cooper, W. C. A study of the polarographic behaviour of dropping amalgam electrodes, 3180
Furrer, W., Lauber, A. and Werner, P. H. Combating noise in offices, 4215
Furry, W. H. On bound states and scattering in positron theory, 2378
Furry, W. H. and Pitkanen, P. H. Gaseous diffusion as a random process, 6077
Furst, M. *See also* Kallmann, H., 224, 4301, 6280, 7775
Furst, M. and Kallmann, H. Phosphorescent effects with high energy radiation, 6892
Fürst, O. *See* Richter, H., 5820
Fürth, R. Masses of fundamental particles, 849. The "velocity" of Brownian movement, 1628. Space-charge distribution, characteristic and current fluctuations in "double diodes," 6286. Considerations regarding the emission of photons from sources of radio waves, 7111
Fürth, R. and Humphreys-Owen, S. P. F. Coherent scattering of light by monocrystals and intrinsic block structure, 6152
Furuichi, J. and Mitsui, T. Domain structure of Rochelle salt, 1041
Fuson, N. *See* Josien, M.-L., 7740

Gabillard, R. A simplified apparatus for the study of paramagnetic nuclear absorption, 3636. Measurement of the relaxation time T_2 in the presence of an inhomogeneity in the magnetic field more important than the width of the line, 6352. Theoretical interpretation of the form of the nuclear resonance signals in the most general case, 7184. Influence of the phase memory of a spin system on the form of the nuclear resonance signals, 8126. Perturbation of the "phase memory" of a spin system by fluctuations in time of the magnetic field, 8521. *See also* Grivet, P., 8124; Soutif, M., 8123
Gabillard, R. and Soutif, M. A new method of measuring weak frequency shifts in nuclear paramagnetic resonance, 9604
Gabor, D. Communication theory and physics, 1594. Electron-optical systems with helical axis, 4435. Microscopy by reconstructed wave fronts. II, 6909. Plasma oscillations, 8054
Gabovich, M. D. Calculation of optimum focusing of a beam by an electron lens, taking account of space charge, 8767
Gadd, J. O., Jr. *See* Scheraga, H. A., 8664
Gaertner, H. The transmission of the turbid atmosphere for infrared rays, 3987

Gaerttner, E. R. and Yeater, M. L. Photonuclear effects in carbon from 100 MeV betatron X-rays, 5773. The photodisintegration of He^4 nuclei by X-rays from a 100-MeV betatron, 7271

Galambos, R. Neurophysiology of the auditory system, 2240

Galanin, A. D. Radiation corrections in quantum electrodynamics, 9269

Galanin, M. D. Measurements of the duration of fluorescence by means of a "phase fluorometer," 2552

Galkin, A. A. and Bezuglyi, P. A. Destruction of superconductivity by an alternating current, 9488

Galkin, A. A., Kan, Ya. S. and Lazarev, B. G. Some peculiarities of the transition into the superconducting state. I, 9486

Galkin, A. A., Lazarev, B. G. and Bezuglyi, P. A. Some peculiarities of the transition into the superconducting state. II, 9487

Gallais, F. and Wolf, R. Magnetic rotatory power and constitution of hydrogen peroxide, 3689

Gallaway, W. S. *See* Hawes, R. C., 3429

Galli, M. Consideration of two postulates of relativity. Special theory, 3313. Electromagnetic induction and the principle of relativity, 5089. Phase and group velocity in relativistic optics, 6821

Gallone, S. and Salvetti, C. Influence of the injection function [of energy] on the distribution of thermal neutrons in a multiplying medium, 645. The effect of the mean free path of fast neutrons on the distribution of thermal neutrons in multiplying media, 2066. Energy level perturbation of a particle in a spheroidal potential well, 5657

Galperin, F. Investigation of the magnetic resources of alloys of manganese with nickel and cobalt, 3627. Investigation of the magnetic properties of ordered alloys, 3630. Investigation of the magnetic characteristics of ordered alloys of the system Co–Mn, 8021. Variation of the saturation magnetization of iron under elastic multilateral compression stress, 8868

Galperin, F. and Perekalina, T. Investigation of the gyromagnetic effect with a classical resonance method, 6353

Galt, J. K. *See also* Yager, W. A., 1929

Galt, J. K., Yager, W. A., Remeika, J. P. and Merritt, F. R. Crystalline magnetic anisotropy in zinc manganese ferrite, 4520

Galy, A. *See* Chapelle, J., 1774

Gamba, A. The uncertainty relation, 858. A generalization of the uncertainty relations, 859. Transformation properties of spin ½ fields, 2375. A strange consequence of the equations of Einstein's new unified theory, 7503. A theoretical investigation of the photodisintegration of the alpha-particle. I, 9703

Gamburg, D. Yu. Volume behaviour of diluted gaseous solutions near the critical point of the pure solvent, 9424

Gammell, J. L. *See* Reitz, J. R., 7380

Gamow, G. Hydrogen exhaustion and explosions of stars, 7495. *See also* Belzer, J., 3292

Gamow, G. and Longmire, C. The problem of red giants and Cepheid variables, 49

Ganguly, S. C. and Chaudhuri, N. K. Directional properties of single crystal of anthracene regarding fluorescence phenomena, 5297

Garach, J. and Barchewitz, P. Differentiation between acenaphthene and naphthalene by their absorption spectra in the infra-red from 3 to 15 μ, 9373

Garbuny, M. Graphical representation of particle trajectories in a moving reference system, 366

García, J. A. Gomez. *See* Gomez García, J. A.

García Riquelme, O. *See* Catalán, M. A., 9367

Garcia-Serrano, V. Inglada. *See* Inglada Garcia-Serrano, V.

Gardner, E. *See* Barkas, W. H., 6473

Gardner, F. F. The use of atmospherics to study the propagation of very long radio waves, 2864

Gardner, H. J. Accurate potentials with the dropping mercury cathode, 3862

Gardner, J. H. Measurement of the magnetic moment of the proton in Bohr magnetons, 8901

Gardner, J. W. Directional correlation between successive internal-conversion electrons. II, 3753. Beta-alpha-correlation in the disintegration of Li^8, 5703. On the elimination of divergences from classical electrodynamics, 6358

Gardner, W. L. *See also* Sagane, R., 6476

Gardner, W. L., Knable, N. and Moyer, B. J. Li^9—New delayed neutron emitter, 9732

Garelli, C. M. On the spectrum of mesons in function of the atmospheric depth, 461

Garelli, C. M. and Wataghin, G. Cosmic radiation at large depths, 450. Cosmic rays underground, 453

Garg, S. N. New bands of SiCl, 7743

Garger, K. S. Radiation of the plasma of the glow discharge in moist air, 7925

Garland, G. D. Combined analysis of gravity and magnetic anomalies, 3955

Garlick, G. F. J. *See* Bull, C., 968

Garner, W. E. Adsorption and catalysis on oxides. Introductory paper, 2124

Garner, W. E., Gray, T. J. and Stone, F. S. Reactions on the surface of copper oxide, 1413

Garoff, K. *See* Edwards, E. V., 1201

Garrett, A. B. and Woodruff, S. A. Study of several physical properties of electrolytes over the temperature range of 25°c to −73°c, 9321

Garrett, C. G. B. The nuclear specific heat in paramagnetic cupric salts at temperatures below 1°K. I. Thermodynamic measurements made from a study of the field-dependence of the adiabatic susceptibility, 1183; II. The nuclear specific heat, 1184. Experiments with an anisotropic magnetic crystal at temperatures below 1°K, 5582. An antiferromagnetic transition curve in a cobalt Tutton salt below 0·1°K, 6350. The critical field curve in an antiferromagnetic crystal, 8835

Garrett, J. T. *See* Schweitzer, G. K., 7231

Garrett, M. W. Axially symmetric systems for generating and measuring magnetic fields. I, 9584

Garrigue, H. Research into the radioactivity of free air, 5941. Renewed outbreak anomalies in the radioactivity of the atmosphere at medium altitudes, 5942. The inflow of radioactive air of atomic origin and its influence on atmospheric precipitation, 5943

Garrison, W. M. *See* Gile, J. D., 2032, 2997, 4700, 5751, 8966–7; Haymond, H. R., 2996, 4701

Garstang, R. H. Self-consistent field, with exchange, for Ne III, 1983. Some line strengths for ionized neon, 9644

Garstens, M. A. Paramagnetic resonance at very low fields, 4531. Internal motion of hydrogen absorbed in tantalum, 4570

Garstens, M. A. and Ryan, A. H. Paramagnetic resonance in metal ammonia solutions at very low fields, 4532

Gartlein, G. W. Protons and the aurora, 4001, 4955. Auroral spectra showing broad hydrogen lines, 6654

Garton, W. R. S. Absorption spectrum of tin vapour in the Schumann region, 207. Emission band of the Cd$_2$ molecule at λ2212, 5259. Extension of line series in the arc spectrum: ultra-violet absorption bands probably due to InH and GaH, 6129. Ultra-violet absorption spectra of tin vapour in atmospheres of helium and hydrogen, 6876

Garwick, J. V. A problem in heat conduction, 5347

Gaskell, T. F. and Swallow, J. C. Seismic refraction experiments in the North Atlantic, 6606

Gáspár, R. *See* Gombás, P., 8135–6

Gatland, K. W. Orbital rockets. I. Some preliminary considerations, 6763

Gatti, E. A 99-channel pulse spectrograph, 395. *See also* Colli, L., 1879; Facchini, U., 622, 4734, 4738

Gattiker, A. R. *See* Dainton, A. D., 5967

Gaudin, A. M. *See* Senftle, F. E., 8153

Gaume, F. Thermal variations of the Faraday effect in liquid oxygen, 8075

Gaume-Mahn, F. Preparation and magnetic properties of magnesium-rich gadolinium-magnesium alloys, 7095

Gaunt, H. M. and Craggs, J. D. Electrical and optical characteristics of d.c. corona discharge, 6234

Gauthier, G. Study of peturbations in the spectra (0·9–1·9 μ) of saturated straight-chain hydrocarbons and ethers, 1732. Quantitative study of the harmonics of the CH, CH$_2$ and CH$_3$ valency vibrations, 1734. Qualitative studies of the absorption bands of liquid saturated aliphatic hydrocarbons in the near infra-red, 1738. Remarks on the absorption spectrum of liquid benzene in the near infra-red, 3442

Gauthier, J. *See* Berthier, P., 9598

Gautier, P. *See* Fert, C., 9586
Gauvin, W. *See* Wiebe, A. K., 5862
Gauzit, J. The light of the night sky, and its origin, 1546
Gavallas, L. A. *See* Kagan, Y. M., 3540
Gavreau, V. Note on stroboscopes and musical strobographs, 7643
Gavrilyuk, V. M. and Strashkevich, A. M. The potential field of duants ["dees"]. II, 7944
Gay, P. and Hirsch, P. B. An X-ray technique for the study of sub-structures in materials, 8250. A non-destructive X-ray method for the determination of the thickness of surface layers, 9130
Gay, P., Hirsch, P. B., Thorp, J. S. and Kellar, J. N. An X-ray micro-beam technique: II—A high intensity X-ray generator, 6252
Gaydon, A. G. Flames: their structure and radiation, 3492. *See also* Pannetier, G., 6846; Pearse, R. W. B., 186
Gaydon, A. G. and Wolfhard, H. G. Spectroscopic studies of low-pressure flames. V. Evidence for abnormally high electronic excitation, 2619. The excitation of HCO, C_2 and CH bands in flame spectra, 5254. Predissociation in the spectrum of OH; the vibrational and rotational intensity distribution in flames, 7671
Gaze, V. F. *See* Shaĭn, G. A., 8469
Geballe, T. H. *See* Lyon, D. N., 305
Gebauer, R. On the time-variation of the intensity asymmetry of the hydrogen Stark effect, 2501
Gebbie, H. A. *See also* Banbury, P. C., 7889
Gebbie, H. A., Harding, W. R., Hilsum, C., Pryce, A. W. and Roberts, V. Atmospheric transmission in the 1 to 14 μ region, 3988
Gebbie, H. A. and Saker, E. W. Properties of amorphous selenium in the infra-red, 5238
Gee, G. *See also* Bateman, L., 4853, 9057
Gee, G., Stern, J. and Treloar, L. R. C. Volume changes in the stretching of vulcanized rubber, 3822
Geel, W. C., van. *See* van Geel, W. C.
Geerk, J. Mass spectrometer as an instrument for the analysis of matter, 5477. *See also* Neuert, H., 5485
Geerk, J. and Neuert, H. Ionization and dissociation by electron impact in methane, methyl alcohol and methylal, 1139
Gegechkori, N. M. Experimental investigation of the channel of the spark discharge, 6987. *See also* Abramson, I. S., 6986
Géhéniau, J. Study of spinor fields and their quantization, 843. Singular solutions of the Klein Gordon equation in an external magnetic field, 855. The singular functions of the Klein–Gordon equation, taking account of an external magnetic field, 3340. Manifolds of electromagnetism, 7514
Géhéniau J. and Demeur, M. Singular solutions of Dirac, equations, taking account of an external magnetic field, 4112
Géhéniau, J. and Sevranckx, R. The polarizability of the proton, 6736
Gehloff, P. O., Justi, E. and Kohler, M. Improved theory of electrothermic refrigeration, 330
Gehman, S. D. *See* Field, J. E., 2637
Geiger, K. The assignment of 1·1 hr. lead, 578. Complex beta-decay in ^{88}rubidium, 5713
Geil, G. W. and Carwile, N. L. Tensile properties of ingot iron at low temperatures, 2105
Geiling, L. Thermocouple bolometers, 2488
Geise, J. H., Bennett, F. D. and Bergdolt, V. E. A simple interferometric test for conical flow, 890
Geisler, A. H. Precipitation and the domain structure of alnico 5, 4527. *See also* Newkirk, J. B., 3911
Geiss, J. High frequency and distortion of a weak a.c. superimposed on a strong d.c. in a superconductor, 6227. Results of the generalized phenomenological theory of superconductivity, 6228
Geiss, W. Investigation of the effect of radiation on small platinum wire resistance thermometers with a cellon glass frame, 2198
Geist, D. A note on the radially symmetrical phase growth controlled by heat conduction, 3905
Geist, J. M., York, J. L. and Brown, G. G. Electronic spray analyzer for electrically conducting particles, 9077
Gelinas, R. W., Class, C. M. and Hanna, S. S. The new state in Li^7 at low bombarding energy, 9700
Geller, R, F. A survey of ceramics for nuclear reactor 2056
Geller, S. *See also* Hoard, J. L., 9171, 9173
Geller, S. and Hoard, J. L. Structures of molecula addition compounds. IV. Trimethylamine-boro trifluoride $(H_3C)_3N–BF_3$, 9172
Geller, S., Hughes, R. E. and Hoard, J. L. Note o the crystalline structure of trimethylamine-borin $(H_3C)_3N–BH_3$, 9168
Geller, S. and Milberg, M. E. Note on the structu of dimethylamine-boron trifluoride, 9169
Geller, S. and Salmon, O. N. Note on the crystallin structures of the methyl cyanide-boron trihalide 9167
Gellért, E. and Petrow, V. The effect of substituen on the ultra-violet absorption spectrum of quin doline, 8633
Gellman, H., Griffith, B. A. and Stanley, J. P. Interna conversion in the L_1-shell, 2981
Geltman, S. *See* Meyerott, R. E., 8534
Gemant, A., Hines, E. and Alexanderson, E. L. Lea location by radioactive gases in buried pipes, 4628
Génard, J. Colorimetry of fluorescent lamps, 7792
Génin, R. *See* Piatier, H., 2771
Genkin, N. M. Investigation of the Hall–Kikoin effec of dynamo steel in strong fields, 6369
Genta, V. Electrical conductivity and lattice disorde of PbS, 9469
Gentner, W. *See* Pahl, M., 561
Geoffrion, C. *See* Persico, E., 3561
George, A. Elliptic polarisation of light scattered b Perspex glass, 237
George, D. E., Hutter, R. G. E. and Cooperstein, M The rotating beam method for investigating electro lenses, 7011
George, E. P. Some nuclear interactions of cosmic ra particles, 478. *See also* Barton, J. C., 2815 Michaelis, E. G., 9578
George, E. P. and Evans, J. Observations of cosmic ray events in nuclear emulsions exposed belo ground, 1169. Disintegrations produced by th nuclear capture of slow negative μ-mesons, 2816
George, E. P. and Jason, A. C. Observations o cosmic-ray penetrating showers at high altitude, se level and below ground, 458
George, E. P. and Trent, P. T. Penetrating burst of cosmic radiation, 8000
George, J. H. B. *See* Woodward, L. A., 2570, 9364
Gerhardt, J. R. *See* Crain, C. M., 4003
Gericke, O. von. *See* von Gericke, O.
Gerjuoy, E. A note concerning the $C^{14}–N^{14}$ β-decay 2970. *See also* Donoghue, J. J., 4136
Gerling, E. K. and Baranovskaya, N. V. Search fo krypton of radioactive origin, 6399
Germagnoli, E. *See* Bracci, A., 2065; Facchini, U. 4734, 4738
Germain, J. *See* Aigrain, P., 5882
Germain, L. S. Differential range spectrum of cosmic ray masons, 1904. Auger effect in astatine, 2983 Stars in photographic emulsions initiated by protons 5752
Germain, P. Application of homographic approximation to the study of supersonic flows, 6788
Germer, L. H. Arcing at electrical contacts on closure I. Dependence upon surface conditions, and circui parameters, 6989; II. The initiation of an arc 9507
Gerosa, A. and Setti, R. L. High energy event in nuclear emulsions at 4 550 m, 9582
Gerritsen, A. N. and Linde, J. O. The electrical resistance of silver-manganese alloys at low temperatures. I. The resistance from 273°K to 1°K 8727; II. The resistance in a magnetic field, 8744
Gerson, N. C. Sporadic *E* movements, 4920. Correlation of auroras with increased cosmic ray intensities (November 19, 1949), 7055. A critical survey of ionospheric temperatures, 7409. Radio observations of the aurora on November 19, 1949, 7422 Abnormal *E* region ionization, 8377
Gerson, N. C. and Kaplan, J. Nomenclature of the upper atmosphere, 3973
Gerstein, M., Levine, O. and Wong, E. L. Flame propagation. II. The determination of fundamental burning velocities of hydrocarbons by a revised tube method, 3493

Gerstenkorn, H. and Sauter, F. On the variation of the electrical resistance of pure metals at the melting point, 6226

Gertsriken, S. *See* Butsyk, M., 2079

Geschwind, S. *See also* Gunther-Mohr, G. R., 4610

Geschwind, S. and Gunther-Mohr, R. Microwave study of Ge, Si, and S masses, 4622

Geschwind, S., Gunther-Mohr, R. and Townes, C. H. Ratio of quadrupole moments of Cl^{35} and Cl^{37}, 4609

Gething, P. J. D. Critical examination of the gravitational theory of the origin of cosmic rays, 1906

Gezelius, R. J. E. Making small metal tubes by electrodeposition on nylon fibers, 1431

Gharpurey, M. K. *See* Brú, L., 3907

Gherzi, E. Echoes from the *D*- and F_2-layers on a frequency of 21 Mc/s? 4921

Ghiorso, A. Complex alpha-spectrum of U^{235}, 7223. *See also* Barton, G. W., Jr, 4655; Cunningham, B. B., 6469; Fleming, E. H., Jr, 7207; Karraker, D. G., 7224; Meinke, W. W., 4653; Rasmussen, J. O., 2008; Street, K., Jr, 565; Thompson, S. G., 2949–50, 3721

Ghiorso, A., Brittain, J. W., Manning, W. M. and Seaborg, G. T. The uranium isotope U^{236}, 6404

Ghiorso, A., Thompson, S. G., Street, K., Jr and Seaborg, G. T. Californium isotopes from bombardment of uranium with carbon ions, 3762

Ghormley, J. A. *See also* Jenks, G. H., 2946

Ghormley, J. A. and Hochanadel, C. J. A cobalt gamma-ray source used for studies in radiation chemistry, 8307

Ghosh, B. N. *See* Szwarc, M., 535

Ghosh, J. G., Sastri, M. V. C. and Vedaraman, S. Adsorption studies on methanol synthesis catalysts. I. Adsorption of carbon monoxide and hydrogen on zinc oxide-chromium oxide mixtures, 3157

Ghosh, M. and Ghosh, S. K. Dynamics of the vibration of a bar excited by the longitudinal impact of an elastic load, 9340

Ghosh, N. N. On complex tensor calculus, 1

Ghosh, S. K. *See* Ghosh, M., 9340

Ghoshal, S. N. An experimental verification of the theory of compound nucleus, 2991

Giacomello, G. Chemical effects of the bombardment of pyridine oxalate with neutrons, 9774

Giacomo, P. *See* Brochard, J., 8247

Gialanella, L. The expanding universe, a decisive test of the theory of relativity? 21

Gianola, U. F. The correction of the spherical aberration of electron lenses using correcting foil element, 3560

Giansoldati, A. and Kronquist, E. "Compensated" elastic-ring balance, 8906

Gião, A. On the general motion of matter on the cosmological scale, 20. On the origin of positive and negative electricity, 1815. On the general motion of matter at the cosmological scale, 2311. Field equations, equations of motion and wave-function. I, 2387; II, 5127

Giauque, W. F. *See also* Barieau, R. E., 2646

Giauque, W. F., Barieau, R. E. and Kunzler, J. E. Crystal perfection of $ZnSO_4 . 7H_2O$. Partial molal heat capacity, heat content and vapor pressure of its aqueous solutions. Thermodynamics of Clark cell, 2647

Gibbs, P. *See* Eyring, H., 4806

Gibellato, S. Ordinary and evanescent e.m. waves caused by plane distributions of charge and current, 516

Gibson, A. F. The absorption spectra of solid lead sulphide, selenide and telluride, 192. A two-colour infra-red radiation pyrometer, 5366. The sensitivity and response time of lead sulphide photoconductive cells, 7895*. *See also* Chasmar, R. P., 7894*

Gibson, J. E. *See* Reich, H. J., 7890

Gibson, W. M. *See also* Burrows, H. B., 3017; Catala, J., 6270

Gibson, W. M. and Català de Alemany, J. Energy spectrum of protons produced in the reaction $C^{13}(d, p)C^{13}$, and its relation with the possible excited states of C^{13}. I, 4716

Gibson, W. M., Grotdal, T., Orlin, J. J. and Trumpy, B. The photodisintegration of the deuteron, 5775

Gibson, W. M., Payne, R. M. and Català de Alemany, J. Comparative study of the Ilford G5 and C2 nuclear emulsions in the analysis of the $Be^9(d, p/t/\alpha)$ reactions, 9538

Giegerl, E. and Broda, E. Emission of slow neutrons by a radium-beryllium source, 4767

Gierer, A. Anomalous D^+ and OD^- ionic mobility in heavy water, 3138

Gierer, A. and Wirtz, K. On the theory of supersonic absorption, 146. Theory of structure of water, 3383

Gierula, J. Coincidences in GM-counters due to single gamma-photons, 8949

Giesekus, H. The line spectrum of the rare-earth crystalline salts. I. The splitting of the electronic terms of rare earths ions in a crystal field (static one-atom model), particularly in $R(BrO_3)_3 . 9H_2O$, 6122; II. The effect of lattice vibrations on the spectral lines of rare earths ions in a crystal field (dynamic one-atom model), 6123

Gigaillot, Y. V. *See* Zhigailo, Y. V.

Gigas, E. The electric eye, 3305

Gigli, A. *See* Amaldi, E., 463, 1910; Sacerdote, G. G., 5191

Giguère, P. A. The thermodynamic functions of hydrogen peroxide, 280. *See also* Foley, W. T., 8243; Innes, K. K., 9633

Gilbert, G. A. and Rideal, E. K. Direct estimation of the electrons involved in polarographic reduction, 9110

Gilbert, W. S. *See* Peterson, J. M., 5767

Gildart, L. and Ewald, A. W. Electron mobility and luminescence efficiency in cadmium sulfide, 6967

Gile, J. D., Garrison, W. M. and Hamilton, J. G. Carrier-free radioisotopes from cyclotron targets. XI. Preparation and isolation of Os^{185} and $Re^{183, 184}$ from tungsten, 2032; XIII. Preparation and isolation of Sc 44, 46, 47, 48 from titanium, 2997; XIV. Preparation and isolation of $Bi^{204, 206}$ from lead, 4700; XVII. Preparation and isolation of Fe^{59} from cobalt, 8966; XVIII. Preparation and isolation of Cr^{51} from vanadium, 8967

Gile, J. D., Haymond, H. R., Garrison, W. M. and Hamilton, J. G. Carrier-free radioisotopes from cyclotron targets. XVI. Preparation and isolation of Pd^{103} from rhodium, 5751

Giles, C. G. and Sabey, B. E. The effect of pressure and friction on photographic emulsions, 8417

Gill, E. W. B. Physics of clouds and precipitation (disc.), 4942

Gill, P. S. *See also* Rais-Ahmed, 341; Yasin, M., 6278, 9541

Gill, P. S., Mandeville, C. E. and Shapiro, E. Some properties of the 43-day isomer of Cd^{115}, 1993. The 43-day isomer of cadium (115), 6408

Gill, S. A process for the step-by-step integration of differential equations in an automatic digital computing machine, 1562. The diagnosis of mistakes in programmes on the EDSAC, 5000

Gillain, F. *See* Gillon, L., 2809

Gillam, D. G. Aqueous diffusion measurements by the Lamm scale method and their correlation with membrane diffusion measurements, 5159

Gilleo, M. A. *See* Cronemeyer, D. C., 6855

Giller, E. B., Duffield, R. B. and Drickamer, H. G. Erratum: Thermal diffusion in the critical region. II, 2436

Gilles, A. *See also* Bauple, R., 2525

Gilles, A. and Vodar, B. Spectrograph with a Féry prism for the Schumann ultra-violet, 939

Gilles, P. W. and Wheatley, Q. de L. The thermodynamic properties of gaseous titanium, 4353

Gillespie, W. M., Jr. *See* Guyton, A. C., 4957

Gillis, J. and Eeckhout, J. Some notes on spectrochemical technique, 4887. Supplementary notes on the use of the echelon-type logarithmic sector in spectral analysis, in combination with a rapidly intermittent light source, 4888

Gilloch, J. M. *See* McCrea, W. H. The relativistic mass of a rotating cylinder, 1596

Gillon, L., Gillain, F. and Melin, A. Some rare phenomena in photographic emulsions exposed to cosmic rays, 2809

Gilman, T. S. *See* Powell, R. E., 8337; Rotariu, G. J., 7603

Gilmour, A. Solution of certain unsteady heat flow problems by relaxation methods, 6918

Gilotaux, P. Modern tendencies in material for recording on discs, 169

Giltay, J. [Hysteresis] properties of ferromagnetics, 1187. On ferromagnetic states, 9606

Gilvarg, A. B. *See* Severny, A. B., 7454

Gilvarry, J. J. and Browne, S. H. Application of Liouville's approximation to the blind navigation problem, 59

Gilvarry, J. J. and Rutland, D. F. General theory of voltage stabilizers, 7971

Gimeno Riutort, A. *See* Due Rojo, A., 6608

Gindin, I. A. and Startsev, V. I. Twinning in bismuth, 7373

Gindin, L. G., Frenkel, Ya. I. and Shpanskaya, O. A. Formation of "bridges" in suspensions of conductors or semi-conductors in dielectrics. I. Conducting-bridge formation of aluminium in vaseline oil, 3550

Gindin, L. G., Moroz, L. M., Putilova, I. N. and Frenkel, Ya. I. The mechanism of electrical puncture of liquid dielectrics with suspended metals, 2721. Formation of "bridges" in suspensions of conductors or semiconductors in dielectrics. II, 6248

Ginnings, D. C. *See* Douglas, T. B., 5369

Ginther, R. J. Luminescence of K_4MnCL_6 and KCL(Pb + Mn), 3457. *See also* Schulman, J. H., 2559

Ginsborg, B. L. and Heavens, O. S. The deposition of rhodium on Perspex, 5817

Ginzburg, V. L. Cosmic rays as a source of galactic radio-radiation, 5013

Giorgi, G. The teaching of physics: the difficulties of a definition of the magnetic field, 483

Giorgi, M. and Rosini, E. On the nature of the causes of microseisms, 3218

Giovannozzi, M. *See* Franchetti, S., 7996

Girgis, R. K. *See* Yousef, Y. L., 7059

Girin, O. P. *See* Stepanov, B. I., 7146

Gish, O. H. and Wait, G. R. Thunderstorms and the earth's general electrification, 3996

Gittings, F. J. A modification in the construction of calorimetric resistance thermometers, 7822

Giulotto, L. *See also* Chiarotti, G., 9642

Giulotto, L. and Loinger, A. External frequencies and specific heat of calcite, 8704

Glancy, A. E. Differential correction of an optical system, 6099

Glansholm, D. and Kleman, B. The use of photomultipliers in spectroscopy, 936

Glascock, R. F. Estimation of radioactive hydrogen as tritiobutane in the Geiger counter, 9115

Glaser, D. A., Hamermesh, B. and Safonov, G. Momentum distribution of charged cosmic-ray particles at sea level, 1905

Glaser, F. W. A note on the metallic behaviour of $MoSi_2$, 2683

Glaser, G. The light emission from high-current spark discharges. I, 353; II, 354

Glaser, H. The absolute absorption coefficient of germanium and the fine structure in the *K* edge of some of its compounds, 5451

Glaser, W. Direction double focusing of electron beams in inhomogeneous electromagnetic fields, 2739. The refractive index of electron optics and its connection with the Routhian function, 3569. Correction to W. Glaser's paper "Calculation of the optical constants of strong magnetic electron lenses," 5457

Glaser, W. and Bergmann, O. On the significance of the concepts "focal point" and "focal distance" in electron optics, and on strong electron lenses with Newtonian image equations, 2731, 7010

Glaser, W. and Grümm, H. The caustic surface of electron lenses, 1098

Glaser, W. and Lenz, F. Computation of the electron optical focusing of three typical strong magnetic lenses and their relation with the usual lens equation, 7009

Glass, F. M. *See* Goss, C. G., 6283

Glass, W. G. *See* Smullin, L. D., 9615

Glatt, L. and Ellis, J. W. Near infrared pleochroism. II. The $0{\cdot}8$–$2{\cdot}5\mu$ region of some linear polymers, 4287

Glauberman, A. E. Theory of systems of electrically charged particles, 9063

Glauberman, A. E. and Talyanskiĭ, I. I. Theory of the issue of electrons from a metal in an electric field, 8729

Glaze, F. W. *See* Florence, J. M., 1761

Gleason, G. I., Taylor, J. D. and Tabern, D. L. Absolute beta counting at defined geometries, 7198

Glegg, D. R. *See* Chesterman, W. D., 4026

Gleichauf, P. H. Electrical breakdown over insulators in high vacuum, 5441, 6250

Gleissberg, W. The mean sunspot curve, 4051. A modification of long-term sunspot prediction, 7466. The average sunspot curve, 7467

Gleissberg, W. and Kiral, A. Prediction of the coming sunspot minimum, 2332

Glendenin, L. E. *See also* Fried, S., 4639

Glendenin, L. E. and Solomon, A. K. Self-absorption and backscattering of β-radiation, 2971

Glicksman, M. *See* Millar, C. H., 1292

Gliese, W. and Walter, K. Polarimetric investigations on the reflection nebula NGC 7023, 7477

Gliessman, J. R. *See* Hung, C. S., 310

Glocker, R. *See* Frohnmeyer, G., 6571

Glockler, G. The heat of dissociation of carbon monoxide, 2644. The heat of dissociation in nitrogen, 2645. Estimated bond energies in carbon, nitrogen, oxygen and hydrogen compounds, 4869

Glockler, G. and Sausville, J. W. The electron affinity of the carbon atom, 6393

Gluckstern, R. L. and Bethe, H. A. Neutron-deuteron scattering at high energy, 4765

Glueckauf, E. Theory of sorption columns, 6543. *See also* Duncan, J. F., 6543

Glueckauf, E. and McKay, H. A. C. Possible *f*-shell covalency in the actinide elements, 1457

Gnevyshev, M. N. and Gnevysheva, R. S. Observations of the solar corona outside eclipse in rays 6374·5 Å and of prominences in rays 6562·8 Å, 5033

Gnevysheva, R. S. *See* Gnevyshev, M. N., 5033

Gobedzhishchbili, M. S. Radiative disintegration of scalar mesons, 5793

Gobeily, M. A. El. *See* El Gobeily, M. A.

Goche, O. The crystal structure of platinum [di]oxide, PtO_2, 8355

Godard, L. and Lafargue, G. On a procedure to measure the charges carried by fine electrified particles, 1068

Goddu, R. F. and Rogers, L. B. Counting of radioactivity in liquid samples, 9650

Godefroy, A. Registering apparatus for the measurement of high and variable resistance: application to the measurement of electric conductivity of the air, 6652

Godfrey, G. H. A simple method for the determination of the focal length and principal points of an optical system, 1714

Godlove, I. H. Color change from daylight to night light, calculated and observed, 6156. *See also* Davidson, H. R., 2550

Godoli, G. On the cycle of the prominences, 8455. *See also* Righini, G., 2331, 3282, 4052–3

Godrich, J. *See* Leah, A. S., 1760

Godycki, L. E., Rundle, R. E., Voter, R. C. and Banks, C. V. Possible existence of a symmetrical O . . . H . . . O hydrogen bond in nickel dimethylglyoxime, 9179

Goeddel, W. V. and Yost, D. M. Ferromagnetism in the manganese-indium system, 6345

Goens, J. The X-rays emitted by arsenic vapour excited in an electromagnetic field of very high frequency, 5448

Goertz, M. Iron-silicon alloys heat treated in a magnetic field, 7084

Goertzel, G. *See* Sollfrey, W., 8503; Tralli, N., 7250

Goertzel, G. H. *See* Rose, M. E., 7249

Goff, J. A. and Gratch, S. Zero-pressure thermodynamic properties of carbon monoxide and nitrogen, 276

Goff, J. A., Gratch, S. and van Voorhis, S. W. Zero-pressure thermodynamic properties of some monatomic gases, 275

Gogueil, J. The first order term of the indirect effect, 8486

Goguel, J. M. Seismic refraction with variable velocity, 3957

Göing, W. A new photographic technique for studying time processes in impulse discharges, 3538

Gokhale, B. G. A curved-crystal [X-ray] spectrograph of high resolving power, 5450. *See also* Frilley, M., 3744–5

Gokhale, G. S. *See also* Chandrasekharan, K. S., 1162; Rao, A. S., 7991

Gokhale, G. S., Pereira, A. W. and Rao, A. S. Cosmic ray intensity measurement of Bangalore 3° N. (mag.), 1163

Golay, M. J. E. Static multislit spectrometry and its application to the panoramic display on infrared spectra, 6839

Gold, L. Analysis of multiple-echo effect arising from the release of a stored wave train, 5177

Gold, T. A design of an ultrasonic delay-line, 7977. *See also* Bondi, H., 9842

Gold, V. Orbital hybridisation and some other considerations concerning the transition state of bimolecular organic substitution reactions, 8319

Goldberg, L. Recent advances in infra-red solar spectroscopy, 37. The abundance and vertical distribution of methane in the earth's atmosphere, 7405

Goldberger, M. L. Note on the general theory of scattering, 6027

Golden, S. and Peiser, A. M. The quantum mechanics of chemical kinetics of homogeneous gas-phase reactions. III. A collision model approximation for intramolecular rearrangements, 9762

Goldenberg, H. A problem in radial heat flow, 7800

Goldfarb, A. R. *See* Saidel, L. J., 7689

Goldhaber, G. The angular distribution of photoprotons from deuterium, 5763. *See also* Bashkin, S., 5816

Goldhaber, G. and Williamson, R. M. Elastically scattered protons from carbon, 5748

Goldhaber, M. *See also* Mateosian, E., 6437, 8946; Mihelich, J. W., 7204; Scharff-Goldhaber, G., 8919

Goldhaber, M., der Mateosian, E., Scharff-Goldhaber, G., Sunyar, A. W., Deutsch, M. and Wall, N. S. Isomeric state of Y^{89} and the decay of Zr^{89}, 8920

Goldhaber, M. and Sunyar, A. W. Classification of nuclear isomers, 8894

Goldhaber, S., Chiang, R. S. H. and Willard, J. E. Some effects of temperature, phase and nature of chemical species on halogen atom reactions initiated by radiative neutron capture and by isomeric transition, 8305

Goldie, A. H. R. The average planetary circulation in vertical meridian planes, 4928

Goldman, A. L., Druzhinin, V. V. and Yanus, R. I. Anisotropy of the magnetic permeability of monocrystals of iron silicide in the range of weak magnetic fields, 1926

Goldman, H. Some remarks on the physiology of glare and vision under reduced illumination, 2253

Goldman, J. E. Single crystal magnetostriction constants of an iron-cobalt alloy, 1956. New techniques and results in the measurement of magnetostriction, 7141

Goldman, J. E. and Smoluchowski, R. Theory of magnetic anisotropy in alnico V, 1936

Goldsack, S. J. *See also* Dilworth, C. C., 467

Goldsack, S. J. and Page, N. An example of the $(n,p;\pi)$ reaction in the photographic emulsion, 6467

Goldsbrough, G. R. The stability of Saturn's rings, 7461

Goldschmidt, G. H. and Hurst, D. G. The structure of ammonium chloride by neutron diffraction, 7394

Goldschmidt, R. Ferromagnetism in weak fields and the Curie point, 7081

Goldschmidt-Clermont, Y. *See* Dilworth, C. C., 467

Goldshtein, T. D. *See* Kosman, M. S., 6945

Goldstein, H. On the lower levels of He^5, 544. The classical motion of a rigid charged body in a magnetic field, 4540

Goldtsein, J. H. *See* Richardson, W. S., 960

Goldstein, J. S. *See* Fowler, R. G., 6992

Goldstein, L. Coherent scattering processes arising from quantum correlations, 6750

Goldstein, L., Lampert, M. and Heney, J. Magneto-optics of an electron gas with guided microwaves, 7126; Erratum, 8853. *See also* Parzen, P., 4553, 5435

Goldstein, L. and Sweeney, D. W. On the theory of slow neutron scattering by solid and liquid helium, 1331

Goldstein, N., Fano, U. and Wyckoff, H. O. Directional distribution of 1040-keV radiation from a high voltage X-ray tube, 4420

Goldstein, S. On the law of decay of homogeneous isotropic turbulence and the theories of the equilibrium and similarity spectra, 7589. On diffusion by discontinuous movements, and on the telegraph equation, 9326

Goldstein, S. and Lighthill, M. J. A note on the hodograph transformation for the two-dimensional vortex flow of an incompressible fluid, 868

Goldstein, T. D. *See* Goldshtein, T. D.

Goldsztaub, S. and Michel, P. Preparation of Ag–Mg alloys in thin layers by the simultaneous evaporation of the constituents in vacuum, 8248

Goldwasser, E. L. *See also* Merkle, T. C., Jr, 415

Goldwasser, E. L. and Merkle, T. C., Jr. The proton component of the cosmic radiation at sea level, 7048

Goldwater, D. L. and Haddad, R. E. Certain refractory compounds as thermionic emitters, 2775

Goldzahl, L. *See* Canac, A., 1861

Golling, E. Absorption spectra of chroma alum crystals, 8634

Gollnow, H. *See* ten Bruggencate, P., 30

Gombás, P. Erratum: On the pressure-volume and pressure-compressibility relation of metals, 4573. On the equation of state of alkali metals, 8707

Gombás, P. and Gáspár, R. On the solution of the Thomas–Fermi–Dirac equation, 8135. Solution of Thomas–Fermi–Dirac equation, 8136

Gomer, R. Wall reactions and diffusion in static and flow systems, 4154. A novel method for the estimation of very low pressures, 8575

Gomer, R. and Dorfman, L. M. Concerning the steric factor of free radical reactions, 4816

Gomer, R. and Kistiakowsky, G. B. The rate constant of ethane formation from methyl radicals, 4831

Gomez García, J. A. Contribution to the study of a cylindrical electromagnetic electron lens, 4436

Gonnermann, H. New graphical methods for the determination of aberrational caustics in optical image formation, 6828

Gonzalez, O. D. *See* Fritz, J. J., 2706

Gonzalez Barredo, J. M. *See* Rice, B., 7771

Good, M. L. Gamma-ray spectrum of K^{40}, 5725. Positron search in K^{40}, 6410. Beta-ray spectrum of K^{40}, 9667. *See also* Wrenn, F. R., Jr, 7437

Good, W. E. *See* Coles, D. K., 6869

Good, W. M., Kunz, W. E. and Moak, C. D. The reactions of $He^3 + He^3$, 8957

Gooden, J. S. *See* Fremlin, J. H., 380

Goodeve, C. The mechanism of thixotropic and plastic flow, 3825

Goodman, B. B. Two new superconducting elements, 2703

Goodman, B. B. and Mendoza, E. The critical magnetic fields of aluminium, cadmium, gallium and zinc, 6979

Goodman, C. *See* Adamson, R. E., Jr, 2999; Baker, W. D., 3002; Delano, V., 1334; Delano, V., 1334; Roseborough, W. D., 8965; Stelson, P. H., 2033, 4714

Goodman, P., Nicholson, K. P. and Rathgeber, H. D. The ionization of cosmic-ray particles, 2782

Goodrich, M. Radiations of Ag^{110}, 6432

Goody, R. M. The experimental determination of the thermal state of the lower stratosphere, 4925

Goody, R. M. and Robinson, G. D. Radiation in the troposphere and lower stratosphere, 9847

Goody, R. M. and Wormell, T. W. The quantitative determination of atmospheric gases by infra-red spectroscopic methods. I. Laboratory determination of the absorption of the $7 \cdot 8$ and $8 \cdot 6\mu$ bands of nitrous oxide with dry air as a foreign gas, 9386

Gopalasvami, S. N. *See* Kulkarni Dzhatkar, S. K., 6198

Gorazdovskiĭ, T. Ya. Theory of an instrument for rheological investigation by deformation of the material between two conical rings, 6517

Gorcum, A. H., van. *See* van Gorcum, A. H.

Gordadze, G. S. The reciprocity principle and the masses of variations, 5546

Gordon, A. N. A linear theory of finite strain, 1360. The field induced by an oscillating magnetic dipole outside a semi-infinite conductor, 5594. Electromagnetic induction in a uniform semi-infinite conductor, 5595

Gordon, A. R. *See* Butler, J. P., 7346; Davies, J. A., 7345

Gordon, B. E. Comparison of the luminescent spectra of crystals and solutions uranyl-sulphate, 2558

Gordon, C. L. Nucleonics, 3891

Gordon, G. and Cady, W. M. An apparatus for time-resolved spectroscopy, 2505

Gordon, M. Statistical kinetics of Hevea rubber cyclization, 2116

Gordon, M. M. The scattering lengths of the deuteron and p–d scattering, 3001

Gordon, W. E. *See* Booker, H. G., 1547; Mooradian, A. J., 9049

Gordy, W. Interpretation of nuclear quadrupole couplings in molecules, 7150. *See also* Anderson, R. S., 4248, 9384. Anderson, W. E., 4270–1; Burkhalter, J. H., 202; Lancaster, F. W., 8846; Sheridan, J., 7175; Trambarulo, R., 2527

Gore, R. C. Infrared spectroscopy, 3893. Infra-red spectra of organic thiophosphates, 7703

Gorelik, G. S. Some magnetic conversion spectra, 2828. Non-linear oscillations, interferences and fluctuations, 2845

Gorke, K. *See* Jenckel, E., 3174

Görlich, P. The application of light-sensitive resistors, 2696

Gorman, J. G., Jones, E. J. and Hipple, J. A. Analysis of solids with the mass spectrometer, 4885

Gorokhovskiĭ, Yu. N., Balabukha, D. K. and Levenberg, T. M. Quantitative estimation of the photographic effect on multi-layer colour-photography materials, 9906

Gorskiĭ, F. K. Damping of torsional oscillations of a ferromagnetic in a magnetic field, 6505

Gorter, C. J. Nuclear magnetic resonance, 1233. Some remarks on antiferromagnetism at low temperatures, 6348. Electrical resistance of some ferromagnetic metals [and alloys] in a magnetic field at low temperatures, 6368. Spectroscopy at radio frequencies, 6851. A possible explanation of the increase of the electrical resistance of thin metal films at low temperatures and small field strengths, 9479. *See also* de Boer, J., 262; Poulis, N. J., 6346; Steenland, M. J., 5581, 5586; Ubbink, J., 7090

Goryunova, N. A. *See* Blum, A. I., 3525

Goss, A. J. and Weintroub, S. Growth of single crystals of tin from the melt, 4894

Goss, C. G. and Glass, F. M. Line noise interference with particle counting, 6283

Goss, F. R. *See* Audsley, A., 2663

Gosting, L. J. and Harned, H. S. The application of the Onsager theory of ionic mobilities of self-diffusion, 3857

Gottlieb, K. *See* Woolley, R. v. d. R., 2338

Gottlieb, M. B. The properties of particles producing high energy nuclear collisions in gold, 5520

Gottlieb, M. B., Hartzler, A. J. and Schein, M. On the particles initiating high energy penetrating showers, 434

Gottstein, K., Menon, M. G. K., Mulvey, J. H., O'Ceallaigh, C. and Rochat, O. Observations on the multiple scattering of ionizing particles in photographic emulsions. I. The value of the scattering constant, 7954

Gottwald, F. and Vieweg, R. Calculations and tests on models for water and air bearings, 2413

Gouarné, R. On the analytical expression of quantities in the theoretical chemistry of some nitrogen derivatives, 1216. On the analytical expression for quantities in the theoretical chemistry of two chains derived from polyenes, 8094

Goubeau, G. Surface waves and their application to transmission lines, 519. On the Zenneck ground wave, 7395

Goucher, F. S. Measurement of hole diffusion in n-type germanium, 4379

Goucher, F. S., Pearson, G. L., Sparks, M., Teal, G. K. and Shockley, W. Theory and experiment for a germanium p–n junction, 4380

Goudot, A. Catalysis in protein-like systems, 4835. Distribution of electrical potential in the particular care of the membrane of a living cell, 5383. Autocatalysis in protein-systems and negative catalysis, 5859. Application of quantum statistics to ionic currents, 6657. A particular problem of signal transmission, 9865

Goulding, F. S. and Perry, K. E. G. A hands and feet contamination monitor, 3717

Gouzou, J. *See* Homès, G.-A., 1366

Govaerts, J. Method for estimation of boron in Pyrex based on absorption of thermal neutrons, 3182. The use of the counter tube Tracerlab TGC3 and of the Nucleometer RCL Chicago for the measurement of K radiation, 6276

Govaerts, J. and Barcia-Goyanes, C. Radiochemical determination of chromium, vanadium and molybdenum by means of radioactive silver, 9803

Govaerts, J. and Jordan, P. Chemical state of atoms formed from U^{238} in the (n,γ) reaction and in natural α-disintegration, 626

Gove, H. E. Angular distributions of (d,p) reactions using 14-MeV deuterons, 4712. *See also* Boyer, K., 5474

Gove, H. E. and Harvey, J. A. Energy levels in Li^7, 5740

Gow, K. V. *See also* Martius, U. M., 5560

Gow, K. V. and Chalmers, B. The preparation of high melting point metal single crystals and bicrystals with pre-determined crystallographic orientation, 9804

Gowan, G. R. *See* Greene, E. F., 4184

Goward, F. K. Betatrons and synchrotrons, 3578. *See also* Wilkins, J. J., 1306, 3774

Goward, F. K., Jones, E. J., Watson, H. H. H. and Lees, D. J. Determination of fission and neutron yields, and the average neutron energy in the photodisintegration of uranium, 3026

Goward, F. K., Lawson, J. D., Wilkins, J. J. and Carruthers, R. The design of electron synchrotrons, 1093

Goward, F. K. and Wilkins, J. J. The photo-disintegration of oxygen into four alpha-particles, 1305. Measurements of gamma-ray momenta and the thresholds of the photodisintegrations $^{12}\mathrm{C} \rightarrow 3\,^4\mathrm{He}$ and $^{16}\mathrm{O} \rightarrow 4\,^4\mathrm{He}$, 3024. The photodisintegration of oxygen into two ^{8}Be nuclei, 3025. Detection of $^{14}\mathrm{N}(\gamma,\ \mathrm{d}\ 3\alpha)$ and $^{14}\mathrm{N}(\gamma,\ \mathrm{pn}\ 3\alpha)$ reactions in nuclear emulsions, 3770

Goyanes, C. Barcia. *See* Barcia Goyanes, C.

Gozzini, A. The dielectric constants of gases in the microwave region, 8717

Graaf-Hunter, J. de. *See* de Graaf-Hunter, J.

Grabner, L. *See also* Hughes, V., 643

Grabner, L. and Hughes, V. The radiofrequency spectrum of K^{39}F by the electric resonance method, 195. Further evidence for a two quantum transition in molecular spectroscopy, 6849

Grace, M. A., Allen, R. A., West, D. and Halban, H. Investigation of the γ-rays from polonium, 6439

Grace, M. A., Beghian, L. E., Preston, G. and Halban, H. The inelastic scattering of fast neutrons, 7281

Graevskaya, Ya. I. *See* Dobrotin, N. A., 8813

Graf, A. A new measuring and recording instrument for micro-barometric investigations, in particular height measurements, 6782

Gráf, T. Electron capture/beta-decay ratio in K^{40}, 1270. On the radioactivity of K^{40}, 7208

Graffi, D. On the propagation of electromagnetic waves in a conducting tube filled with a non-homogeneous dielectric, 5606. On some questions of hereditary elasticity, 6504

Gramont, A. de. *See* de Gramont, A.

Granberry, H. *See* Strother, F. P., 6785

Grandine, L. D., Jr. *See* Ferry, J. D., 6055

Grange, J. *See* de Mallemann, R., 5618

Granger, S. and Spence, R. D. Energy levels of a spheroidal nuclear well, 8117

Gränicher, H. *See* Beck, M., 297

Gransden, M. M. and Boyle, W. S. Neutron deficient isotopes of lanthanum, 5704

Grant, N. J. *See* Servi, I. S., 9033

Grant, P. J. Forbidden β-decay in ^{24}Na, 1284
Granville, J. W. *See also* Henisch, H. K., 7861
Granville, J. W. and Hogarth, C. A. A study of thermoelectric effects at the surfaces of transistor materials, 6968
Grassie, N. and Melville, H. W. A refractometric method for following the non-stationary state of chemical reactions, 6834
Grassmann, F. The elasticity of porous media, 9743
Grassmann, H. Sensitization and desensitization of a silver chloride or silver bromide emulsion by organic compounds which are built up from at least one pyrimidine or iminazole ring, or from both rings, 5963
Gratch, S. *See* Goff, J. A., 275–6
Gray, D. E. Physics abstracting, 1593
Gray, E. Spectral properties of the carbonyl radical: comparison between the vibration spectra (Raman effect and infra-red) of ketones and aldehydes, 3440
Gray, P. Initiation of explosion in liquids, 1393. A parallel beam concentrating monochromator. Study of the abrasion of crystals, 2722
Gray, T. J. Semi-conductivity and catalysis, 1400. Semi-conducting materials. The properties of semi-conducting oxides, 7868. *See also* Garner, W. E., 1413
Gray, T. J. and Savage, S. O. Reactions on the surface of copper oxide. I. Semi-conductivity measurements, 1413
Gray, T. S. *See* Frey, H. B., 5498
Gray, W. C. *See* Cobine, J. D., 1071
Gray, W. M. *See* Crawford, M. F., 2927
Grayson-Smith, H. *See* Vasileff, H. D., 272
Grazhdankina, N. P. *See* Fakidov, I. G., 2641
Grebenkemper, C. J. and Hagen, J. P. The dielectric constant of liquid helium, 1020
Green, A. E. and Shield, R. T. Finite extension and torsion of cylinders, 9747
Green, A. P. The use of Plasticine models to simulate the plastic flow of metals, 5830. A theoretical investigation of the compression of a ductile material between smooth flat dies, 8268
Green, H. S. The quantum mechanics of assemblies of interacting particles, 6758
Green, H. S. and Cheng, K. C. The reciprocity theory of electrodynamics, 6026
Green, H. S. and Messel, H. The differential cross section for high energy nucleon-nucleon collision, 8514
Green, J. R. Penetrating showers in carbon, 2789
Green, L., Jr. *See also* Malmstrom, C., 5833
Green, L., Jr and Duwez, P. Fluid flow through porous metals, 4144
Green, L. C., Weber, N. E. and Krawitz, E. The use of calculated and observed energies in the computation of oscillator strengths and the f-sum rule, 7192
Green, M. Three-line method of obtaining characteristic curves for heterochromous photometry, 2494
Green, M. S. Brownian motion in a gas of noninteracting molecules, 7569
Green, P. E., Jr. Magnetic tape recorder for very low frequency phenomena, 2359
Green, T. A. *See* Fernbach, S., 7291; Stueckelberg, E. C. G., 6728
Greenberg, J. M. and Berlin, T. H. Scattering losses in the synchrotron, 5473
Greenblatt, S. Three-transducer reciprocity formula for vibration pick-ups, 3408
Greene, D. Secondary electron emission from molybdenum produced by helium, neon, argon and hydrogen, 1319
Greene, E. F., Cowan, G. R. and Hornig, D. F. The thickness of shock fronts in argon and nitrogen and rotational heat capacity lags, 4184
Greene, R. F. and Callen, H. B. On the formalism of thermodynamic fluctuation theory, 9434
Greenfield, M. A. and Brown, F. W. Calculation of index of refraction of gases from absorption data, 1715
Greening, J. R. The determination of X-ray wavelength distributions from absorption data, 1086. A method of determining the wavelength distribution of the X-radiation at a point in a scattering medium, 4416
Greenough, A. P. Grain boundaries and sintering, 2078
Greenough, G. B. Residual strains in plastically deformed mild steels, 678
Greenough, M. L. and Williams, W. E. An electronic circuit for measuring the displacement of pressure-sensitive diaphragms, 3356
Greenough, M. L., Williams, W. E., Jr and Taylor, J. K. Regulated low-voltage supply for electrolysis and other uses, 8295
Greenspan, M. Propagation of sound in rarefied helium, 145
Greenstein, J. L. A search for He^3 in the sun, 6688. Erratum: Spectrophotometry of the F stars and of the τ Ursae Majoris, I, 6707. *See also* Page, T., 7478
Greenstein, J. L. and Page, T. Negative hydrogen ions in planetary nebulae, 7479
Greenstein, J. L. and Richardson, R. S. Lithium and the internal circulation of the sun, 6689
Greenwald, S. Changes in lattice constants of Cr$_2$O$_3$ near the Curie temperature, 9597. *See also* Smart, J. S., 5569
Greenwald, S. and Smart, J. S. Deformations in the crystal structures of antiferromagnetic compounds, 492
Greenwood, A. Negative point to plane corona—a new mode of the discharge, 7914
Greenwood, N. N. and Martin, R. L. Discontinuities in supercooled ionic melts, 9323
Gregg, A. B. *See* Bundy, F. P., 7814
Gregg, C. C. *See* Kopelman, B., 9737
Gregg, E. C. A flux-forced field-biased betatron, 4424
Gregg, S. J. and Sing, K. S. W. The effect of heat treatment on the surface properties of gibbsite. I. Adsorption isotherms of nitrogen and of oxygen at − 182·7° c, 9784; II. Isotherms of carbon tetrachloride vapor at 25° c, 9785
Gregory, B. P. and Tinlot, J. H. A cloud-chamber study of nuclear interactions in lead and aluminum. I. 4514; II, 4515
Gregory, N. W. The crystal structure of ferric bromide, 3925
Greig, J. H. and Ferguson, W. F. C. A new mounting for an echelette diffraction grating, 236
Greisen, K. *See also* Walker, W. D., 1913
Greisen, K., Walker, W. D. and Walker, S. P. *N*-component in extensive air showers, 1912
Gremishin, S. G. and Meiklyar, P. V. Photochemical dissolution of the latent image centres and spectral photo-sensitivity of a photographic emulsion, 3248
Grenier, C. Thermal conductivity of liquid helium. I, 7817
Grenville-Wells, H. J. A new method of observing Compton and other incoherent X-ray scattering in crystals, 9825
Greuling, E. and Meeks, M. L. Electron-neutrino angular correlation, 5723
Greve, L. de. *See* de Greve, L.
Grey, D. S. Computed aberrations of spherical Schwarzschild reflecting microscope objectives, 5344
Grey, J. *See* Kantrowitz, A., 5803
Grey, L. E. Pulsed emission from the BaO–SrO–CaO system, 6292
Gribaumont, A. *See* Janssens, P. 3050
Grieco, A. *See* Rorden, H. C., 6508
Griess, J. C., Jr. *See* Brosi, A. R., 4645
Grieve, T. W. and Bredl, J., 3167
Griffel, M. *See also* Stout, J. W., 2835
Griffel, M. and Stout, J. W. Preparation of single crystals of manganous fluoride. The crystal structure from X-ray diffraction. The melting point and density, 1501. The magnetic anisotropy of manganous fluoride between 12 and 295° k, 2836
Griffin, L. J. Microscopic studies on beryl crystals. I. Observation of uni-molecular steps, 8344
Griffith, B. A. *See* Gellman, H. 2981
Griffith, H. D. and Swindell, G. E. Measurement of skin dose in radium therapy, 7436
Griffith, R. H., Chapman, P. R. and Lindars, P. R. The physical properties of promoted molybdenum dioxide catalysts, 1399
Griffith, W. Vibrational relaxation times in gases, 897
Griffiths, G. M. The positron to γ-ray ratio in Zn^{65}, 8925. *See also* Argyle, P. E., 3754; Warren, J. B., 8953
Griffiths, J. H. E. Ferro-magnetic resonance in thin Ni-films, 7080. *See also* Bagguley, D. M. S., 1931
Griffiths, J. H. E. and MacDonald, J. R. An oscillation type magnetometer, 2818

Griffiths, J. H. E. and Owen, J. Paramagnetic resonance in nickel ammonium sulphate, 7096
Grigg, E. C. M. and Lauder, I. Reactions in liquid sulphur dioxide. I. Exchange of oxygen between liquid sulphur and thionyl chloride, 3854
Grigorov, N. L. Composition of the hard component of cosmic radiation in the stratosphere, 3606. *See also* Dobrotin, N. A., 8813; Vernov, S. N., 1899
Grillot, E. and Bancie-Grillot, M. Influence of the state of oxidation of the luminescence centres on the colour of luminescence of zinc sulphide activated by copper, 967
Grilly, E. R. The vapor pressures of hydrogen, deuterium and tritium up to three atmospheres, 5353
Grim, W. M. *See* Frey, H. B., 5498
Grimeland, B., Hellstrand, E. and Netter, F. The measurement of the cross-section for the absorption of slow neutrons by several elements by modulating a pile, 8205
Grimley, T. B. *See* Bawn, C. E. H., 4873
Grison, E. Studies on tellurium-selenium alloys, 9739
Grivet, P. Beta-ray spectrographs with electron lenses. (Unified theory of classical types: a new apparatus.) I, 2734; II, 3563. On the study of lines of weak intensity in nuclear resonance, 9638
Grivet, P. and Ayant, Y. On the paramagnetic displacement of the nuclear resonance frequency, 5574
Grivet, P., Soutif, M. and Gabillard, R. The double T bridge in nuclear magnetic resonance, 8124
Grivet, P. and Vastel, J. Some measurements on a linear accelerator, 4422
Gröbner, W. and Hofreiter, N. Table of integrals. II. Definite integrals [Integraltafel. Zweiter Teil. Bestimmte Integrale], 3250*
Grodzinski, P. Photoelastic investigation on diamond crystals, 100. The effect of lubrication on friction, wear and abrasion, 3842*. Damaged impressions in microhardness testing, 5840. An automatic lightload Bergsman type hardness tester, 5841
Groetzinger, G., Berger, M. J. and McClure, G. W. Determination of the number of neutrons associated with the stoppage of negative μ-mesons in lead, 5737
Groetzinger, G., Berger, M. J. and Ribe, F. L. Erratum: Study of the multiple scattering of fast charged particles in a gas and its role in the interpretation of cloud-chamber tracks, 4451
Groetzinger, G. and Kahn, D. New evidence for the existence of positively charged particles appearing near beta-ray emitters, 1286
Groetzinger, G., Leder, L. B. and Ribe, F. L. Low energy electron resulting from a stopped μ-meson, 4749
Groetzinger, G. and Ribe, F. L. Multiple scattering of the particles producing the "positive tracks" appearing near beta-ray emitters, 1285
Grogan, J. D. The uranium-iron systems, 774
Groot, S. R. de. *See* de Groot, S. R.
Groot, W. de. *See* de Groot, W.
Grosjean, C. C. On the slowing down of neutrons, 4769. *See also* Nuyens, M., 6477
Grosjean, P. V., Static meson potentials and the deuteron problem, 1619
Gross, B. Static charges on dielectrics, 296. Relaxation spectrum for rubber, 9753
Gross, B. and Pelzer, H. On creep and relaxation. III, 8273
Gross, E. F. and Valkov, V. I. Vibration spectrum of hydrogen bonds, 2561
Gross, E. P. Plasma oscillations in a static magnetic field, 4399. *See also* Bohm, D., 352
Gross, L. *See also* Hamilton, D. R., 2737
Gross, L., and Hamilton, D. R. The beta-spectrum of sulfur 35 in the range of 0–30 kilovolts, 2012
Gross, M. J. Gas insulation. A new trend in roentgen-ray apparatus, 4015
Grosse, A. V., Johnston, W. M., Wolfgang, R. L. and Libby, W. F. Tritium in nature, 6396
Grossetti, E. On the intensity distribution of the ultrasonic field in liquids, 7629
Grosso, V. A. Del. *See* Del Grosso, V. A.
Grotdal, T. *See* Gibson, W. M., 5775
Groth, W. *See also* Beyerle, K., 5678; Faltings, V., 5681
Groth, W. and Harteck, P. Isotope enrichment in ultracentrifuges with hydrogen stabilization, 5680
Grotrian, W. On the present position in the interpretation of the sunspot phenomena, 811
Grotrian, W. and Kunzel, H. On the magnetic flux through sunspots, 3284
Grotz, L. *See* Pimentel, G. C., 5273
Grove, D. M. *See* Barrer, R. M., 8570–1
Grove, G. R. and Cooper, J. N. The gamma-ray yield of phosphorus bombarded with protons, 5749
Grove, G. R., Cooper, J. N. and Harris, J. C. Gamma-ray resonances produced by the bombardment of phosphorus with protons, 1304
Grove, J. R., Hoare, M. F. and Linnett, J. W. The shadow cast by a bunsen flame, its production and usefulness, 259
Gruen, H. *See* Baños, A., Jr, 2857
Grum-Grzhimaïlo, N. V. The problem of electric resistance of one-phase monovalent metals, 9483
Grümm, H. *See* Glaser, W., 1098
Grundfest, H. *See* Tobin, M. W., 4362
Gubanov, A. I. Theory of the contact of two semiconductors of the same type of conductivity, 6960. Theory of the contact of two semiconductors of different type of conductivity, 7853. On the theory of semiconductors with mixed conductivity, 8732
Guében, G. On the determination of effective cross-sections for thermal neutrons, 3795, 4730
Guénoche, H. On the propagation of flames in gaseous mixtures, 8284
Guest, P. G. Estimation of the error at a point on a least-squares curve, 789. Estimation of the errors of the least-square polynomial coefficients, 2303
Guest, P. G. and Clouston, J. G. Fresnel interference in the Michelson interferometer, 2577
Gugelot, P. C. Neutron spectra from nuclear reactions induced by 16-MeV protons, 3003
Guggenheim, E. A. The computation of electric dipole moments, 8884
Guggenheim, E. A. and McGlashan, M. L. Entropies of mixing in certain athermal binary solutions, 282. Statistical mechanics of regular mixtures, 5132. Corresponding states in mixtures of slightly imperfect gases, 5172
Guha, B. C. Magnetic properties of some paramagnetic crystals at low temperatures, 5578
Guha, U. C. Reversal of polarisation of microwaves from sun-spots, 8450. *See also* Saha, M. N., 8860
Guier, W. H. and Roberts, J. H. Energy levels in C^{12} from $Be^9(\alpha, n)C^{12}$, 603
Guillaud, C. Magnetic properties of mixed magnesium-zinc ferrites, 5558. Polymorphism of the compound MnBi at the temperatures of disappearance and reappearance of the spontaneous magnetization, 5565. Transformation points of the compounds MnAs and MnBi in relation to a possible mechanism of antiferromagnetism, 6337. Magnetic properties of ferrites, 6339. Magnetization by rotation (initial susceptibility, coercive field), 7067. Magnetic properties of αFe_2O_3, 7077. Investigation of mixed ferrites of manganese in weak alternating fields, 7102. *See also* Yager, W. A., 4521
Guillaud, C. and Michel, A. Magnetic properties of magnetite containing substituted Al^{3+} ions, in relation to its structure, 3626
Guillemot, E. *See* Chanu, J., 7688
Guinier, A. On the interpretation of the diffusion of X-rays by precipitation hardening alloys, 1354. Study of catalysts by scattering of X-rays at small angles, 1401. The production and application of high-intensity X-ray beams, 2722. Some new uses of X-rays in metallography, 4785. A radiocrystallographic installation with demountable tube, 4903. *See also* Castaing, R., 7387; Fournet, G., 1087
Guinier, A. and Tennevin, J. Researches on the polygonization of metals, 7439
Guiot-Guillain, G. Crystal structure of lanthanum and praseodymium ferrites, 6592
Gulmanelli, P. *See* Caldirola, P., 5517, 9574
Gum, C. S. *See* Allen, C. W., 799
Gum, J. R. *See also* Carss, W. L., 2968
Gum, J. R. and Pool, M. L. Radioactive isotopes of Ag and Cd, 1995
Gunder, D. F. and Friant, D. R. Stability of flow in a rocket motor, 103
Gundlach, J. C. *See* Francis, J. E., Jr, 4477

Gunn, D. L. and Yeo, D. The Bellani spherical pyranometer or radiation integrator; the calibration of an improved model, and some suggestions for further improvements, 9193

Gunn, J. C., Power, E. A. and Touschek, B. The production of π-mesons in proton-proton collisions, 4748*. The production of mesons in proton-proton collisions, 5126

Gunning, H. E. *See* Schlochauer, M., 4821

Gunter, D. F. and Friant, D. R. Stability of flow in a rocket motor, 6051

Günther, N. The geometrical and physiological magnification of optical instruments, 6908

Gunther-Mohr, R. *See also* Geschwind, S., 4609, 4622

Gunther-Mohr, G. R., Geschwind, S. and Townes, C. H. Polarization of the nucleus by electric fields, 4610

Gupta, K. Das. *See* Das Gupta, K.

Gupta, S. N. On the elimination of divergencies from classical electrodynamics, 2842. On the elimination of divergences from quantum electrodynamics, 6022. The S-matrix and radiation damping, 7528. On Stueckelberg's treatment of the vector meson field, 7550

Gupta, U. C. *See* Sundaram, P. N., 1888

Guptill, E. W., Archibald, W. J. and Warren, E. S. Precision determination of nuclear gyromagnetic ratios, 546

Gurev, M. V. *See* Avgul, N. N., 6546

Gurevich, D. B., Tolstoĭ, N. A. and Feofilov, P. P. Relaxation of the photoconductivity of semi-conductors, 6225. Comparison of the relaxation of the photoconductivity with the relaxation of the phosphorescence, 6885

Gurevich, I. M. *See* Biberman, L. M., 1733

Gurevich, L. E. and Lebedinskiĭ, A. I. Laws of planetary distances and planetary revolutions, 2305. Gravitational condensation of a dust cloud, 2317. The properties of clouds from which the planets of the solar system are formed, 2318

Gurevich, L. E. and Levin, B. J. On the formation of double stars, 4055

Gurton, O. A. A discussion on detonation: The fading of detonation in solid explosives, 3125

Guseva, L. G. Investigation of the fast electrons of a plasma, 8755

Gustafson, T. Density of tracks of protons and mesons in photographic emulsions, 9720

Gutfreund, H. Properties of solutions of large molecules, 6655

Guth, E. *See also* Holroyd, L. V., 1459, 6550; Mrowca, B. A., 1460; Mullin, C. J., 4709

Guth, E. and Mullin, C. J. Momentum representation of the Coulomb scattering wave functions, 7559

Guth, S. K. Brightness relationships for comfortable seeing, 4965

Guthrie, A. Leak detectors for industrial vacuum systems, 880

Gutin, S. S. Investigation of the electric characteristics of thin oxide films by the method of the gas-discharge plasma, 7852

Gutmann, F. *See also* Bosson, G., 1063; Breyer, B., 5896–7, 6194

Gutmann, F. and Simmons, L. M. A quantized form of the Boltzmann–Maxwell distribution law, 6756

Gutmann, V. *See also* Jack, K. H., 6584

Gutmann, V. and Jack, K. H. The crystal structures of molybdenum trifluoride, MoF$_3$, and tantalum trifluoride, TaF$_3$, 6583

Gutowsky, H. S. Optical rotation of quartz in the infrared to $9 \cdot 7\mu$, 4314. Nuclear magnetic resonance effects in metals: temperature effects for Na^{23}, 9639

Gutowsky, H. S. and Hoffman, C. J. Chemical shifts in the magnetic resonance of F^{19}, 1976

Gutowsky, H. S. and Levine, H. B. The barrier to internal rotation in methylfluoroform, 1225

Gutowsky, H. S. and McCall, D. W. Nuclear magnetic resonance fine structure in liquids, 6066

Gutowsky, H. S. and McClure, R. E. Magnetic shielding of the proton resonance in H$_2$, H$_2$O and mineral oil, 4605

Gutowsky, H. S., McClure, R. E. and Hoffman, C. J. The nuclear spin of Be^9, 4601

Gutter, F. J. *See* Kegeles, G., 9782

Güttinger, W. The shock effect on a fluid sphere as the basis of a theory of the origin of brain injuries, 4016

Güttner, W. Acoustic transducers for deaf-aids, 6808

Guy, R. Existence of solutions of the operational equation of evolution, 8501

Guy, W. *See also* Towler, J. H., 5244

Guy, W. and Towler, J. H. A note on the calibration of infra-red prism spectrometers, 5247. The effect of change of angle of incidence on the calibration of infra-red prism spectrometers, 9365

Guyomard, F. An experimental study of the radiation of diffusion flames, 8691

Guyton, A. C., Gillespie, W. M., Jr and Armstrong, G. G. Continuous recording of circulatory hemoglobin, 4957

Gvozdover, S. D. and Magazanik, A. A. A study of the paramagnetism of atomic nuclei by the method of magnetic-spin resonance, 7085

Gwinn, W. D. *See* Cunningham, G. L., Jr, 6126; Neu, J. T., 3173

Gyarfas, E. C. *See* Dwyer, F. P., 2131

Gysae, B. On the question of the existence of new α-emitters, 3723

Haag, R. *See* Bopp, F., 4110

Haalck, H. New views on the cause of the permanent magnetic field of the earth, 4912. I. The complete determination of the local perturbations of the gravity field from torsion balance measurements with an example of the calculation (ordnance survey map of Weddingstedt i. Holstein); II. The physical law of the form of the figure of the earth (Theory of the standard form of the earth), 6011

Haar, D. ter. *See* ter Haar, D.

Haar, G. On the nature of the nonlinearity of the ear, 8394

Haas, E. de. *See* de Haas, E.

Haas, F. *See* Carrus, P. A., 3300, 6714

Haas, J. On the determination of the velocity of a moving star cluster, 5039. Considerations of the elements of the galactic orbits and the orientation of the circular velocity, 5040

Haas, L. L. *See* Laughlin, J. S., 7438

Haase, R. *See also* Crützen, J. L., 3110

Haase, R. and Münster, A. On the theory of the infinitely diluted solution, 9320

Hachiya, K., Michijima, M. and Uzawa, Z. The discharge tube vacuum meter, 6074

Hackerman, N. *See* Cooke, E. L., 9084; McClellan, A. L., 6541

Hackerman, N. and Antes, L. L. Contact potentials of evaporated iron films in air and in nitrogen at low pressure, 1033

Hacobian, S. *See* Breyer, B., 5896–7

Haddad, R. E. *See* Aamodt, L., 2023; Goldwater, D. L., 2775; Panofsky, W. K. H., 1300, 4691

Hadley, J. and York, H. Protons and deuterons ejected from nuclei by 90-Mev neutrons, 2050

Haeberli, W., Huber, P. and Baldinger, E. The work per ion pair in gas mixtures for α-particles, 1140

Hafner, E. M. *See* Alburger, D. E., 2912

Haga, T. *See* Morino, Y., 7364

Hagelbarger, D. W., Loh, L. T., Neill, H. W., Nichols, M. H. and Wenzel, E. A. Does diffusive separation exist in the atmosphere below 55 kilometers?, 5683

Hagen, C., Rust, H. H. and Lebowsky, F. Investigation on the effect of ultrasonics on diffusion, 4153

Hagen, J. P. Temperature gradient in the sun's atmosphere measured at radio frequencies, 6690. *See also* Grebenkemper, C. J., 1020

Hagenah, W. The field of flow near a free-burning carbon arc, 338

Haggis, G. H. *See* Hasted, J. B., 8718

Hagman, T. *See* Brandt, O., 1686

Hahn, E. E. Some electrical properties of zinc oxide semiconductor, 6963

Hahn, E. L. Spin echoes, 2922

Hahner, C. H. *See* Florence, J. M., 1761

Haigh, C. P. A toroidal Geiger counter, 9544

Hainer, R. M. and King, G. W. Effect of low temperatures on infra-red spectra, 1716

Haines, H. R. *See* Mott, B. W., 3465, 4302

Haissinsky, M. and Cottin, M. Determination of the autodiffusion coefficient of mercury by the method of isotope exchange, 2425
Håkansson, H. E. V. *See* Hansson, L., 3709
Halban, H. *See* Beghian, L. E., 7244; Bishop, G. R., 1307, 3739, 4723, 9704; Grace, M. A., 6439, 7281; Mims, W., 2028, 3709, 9663; Wilson, R., 388
Hales, A. L. Crustal layers of the Earth, 9841
Halfawy, M. Theory of electrolytic polishing, 6534
Halford, R. S. *See* Newman, R., 196–7
Hälg, W. *See* Bichsel, H., 4733
Hall, C. E. Scattering phenomena in electron microscope image formation, 5458
Hall, D. A. A simplified coupled filter system for absorption chromatography, 9121
Hall, E. O. An optical method for studying the deformation of mild steel, 675. The deformation and ageing of mild steel. II. Characteristics of the Lüders deformation, 9749; III. Discussion of results, 9750. *See also* Sylwestrowicz, W., 6510
Hall, G. *See* Bachman, C. H., 9563
Hall, G. G. The molecular orbital theory of chemical valency. VIII. A method of calculating ionization potentials, 3685
Hall, G. G. and Lennard-Jones, J. The molecular orbital theory of chemical valency. VII. Molecular structure in terms of equivalent orbitals, 3684
Hall, H. On the evaluation of the Fermi β-distribution function, 592
Hall, H. H., Bardeen, J. and Pearson, G. L. The effects of pressure and temperature on the resistance of p–n junctions in germanium, 9477
Hall, N. F. *See* Fried, S., 4639
Hall, R. N. and Dunlap, W. C. P–N junctions prepared by impurity diffusion, 1832
Hall, W. L. *See also* Fry, W. J., 4199
Hall, W. L. and Fry, W. J. Design of variable resonant frequency crystal transducers, 4201
Hall, W. S. *See* Brolley, J. E., Jr, 8917
Hallpike, S. C. and Hood, J. D. Some recent work on auditory adaptation and its relationship to the loudness recruitment phenomenon, 5956
Halpern, J. *See also* Mann, A. K., 3018, 5778; Sher, R., 3771; Stephens, W. E., 5774
Halpern, J. and Mann, A. K. Cross sections of gamma-proton reactions, 7277
Halpern, O. On the viscosity of gaseous He^3, 5171. Polarization effects in $(n$–$\gamma)$ reactions, 5787. Remarks on the optics of radio waves, 7116. Correlation phenomena and capture of polarized neutrons, 8209
Halpern, W. *See* Sommers, H. S., Jr, 8837
Halsall, J. R. X-rays applied to the manufacture of low temperature coefficient quartz crystals, 9819
Halsey, G. D., Jr. The role of heterogeneity in adsorption and catalysis, 1410. New multilayer isotherm equation with reference to surface area, 8311. The parahydrogen conversion on tungsten, 9058. Rate of adsorption on a non-uniform surface, 9082
Halstead, R. E. and Nier, A. O. Gas flow through the mass spectrometer viscous leak, 3392
Halter, J. *See* Hamouda, I., 9000
Halverson, F. and Hirt, R. C. Near ultraviolet solution spectra of the diazines, 6865
Halwer, M. *See* Brice, B. A., 1777
Ham, L. B. *See* Hilton, W. A., 2470
Ham, W. T., Jr and Trout, E. D. Million-volt beryllium-window X-ray equipment for biophysical and biochemical research, 1090
Hamann, S. D. The interpretation of intermolecular force parameters, 7622. *See also* Evans, A. G., 3855
Hamelin, J. and Scherer, M. Nuclear explosions, and the absorption of "narrow" showers in Pb, 4505. The barometric coefficient of narrow air showers, 5525
Hamermesh, B. Neutron capture gamma-ray spectra, 2022. Odd-even effect in neutron capture gamma-ray spectra, 4736. *See also* Glaser, D. A., 1905; Hummel, V., 4740
Hamermesh, B. and Hummel, V. Scintillation counter studies of neutron capture gamma ray spectra, 8942
Hamermesh, M. *See also* Fred, M., 5251
Hamermesh, M. and Eisner, E. The spin of the neutron, 644
Hamilton, D. R. *See also* Gross, L., 2012
Hamilton, D. R. and Gross, L. An electrostatic beta-spectrograph, 2737
Hamilton, J. G. *See* Gile, J. D., 2032, 2997, 4700, 5751, 8966–7; Haymond, H. R., 2996, 4701; Miller, J. F., 1870
Hamilton, W. S. Forces exerted by waves on a sloping board, 3374
Hamm, F. A. Electron microscopy, 3811
Hammack, K. C. *See* Feenberg, E., 4599
Hammel, J. E. *See* Walker, W. D., 8226
Hammond, V. J., Price, W. C., Teegan, J. P. and Walsh, A. D. The absorption spectra of some substituted benzenes and naphthalenes in the vacuum ultraviolet, 7756
Hamon, P. *See* Rohmer, R., 953
Hamouda, I., Halter, J. and Scherrer, P. Scattering of 3·27 MeV (d, d)-neutrons on deuterons in the Wilson chamber, 9000
Hamsher, D. H. *See* Nelson, C. N., 3249
Hanawa, S. *See also* Nakano, T., 5095
Hanawa, S. and Miyazima, T. Radiative corrections to decay processes. I. Meson decay, 80
Hanby, W. E. *See* Bamford, C. H., 3171, 5889, 9837
Handel, J. van den. *See* van den Handel, J.
Handler, P. *See* Wrenn, F. R., Jr, 7437
Hanes, R. M. Suprathreshold area brightness relationships, 4964
Hanle, W. The scintillation counter, 7034
Hanle, W., Kotschak, O. and Scharmann, A. Decay times of organic phosphors, 6882
Hanle, W. and Scherer, H. Experiments concerning interstellar polarization, 5984. Dichroism of stretched films, 8646
Hanle, W. and Schneider, H. Studies with scintillation counters, 8797
Hanley, T. E. Thorium sulfide as a thermionic emitter, 1895
Hanna, G. C. Disintegration of boron by slow neutrons, 2054
Hanna, G. C., Harvey, B. G. and Moss, N. The neutron capture cross section of Am^{241}, 4735
Hanna, G. C., Harvey, B. G., Moss, N. and Tunnicliffe, P. R. Spontaneous fission in Cm^{242}, 4646. Fission in Am^{242}, 4746
Hanna, S. S. *See* Class, C. M., 9699; Gelinas, R. W., 9700; Krone, R. W., 2036; Neuendorfer, J. A., 4708; Resnick, I., 5757
Hänni, H. and Rossel, J. A (n, α) reaction of Fe with slow neutrons, 620
Hänsel, H. *See* Neuert, H., 1032
Hansen, G. Imaging of bulk radiation in spectrographs, 935. New instruments for technical extinction measurements, 9117
Hanson, A. O. *See* Lanzl, L. H., 8778
Hanson, A. W., Taylor, C. A. and Lipson, H. Fourier synthesis by optical interference, 9142
Hanson, E. P. *See* Trump, J. G., 1083
Hansson, I. F. E. The photo-disintegration of the deuteron, 618
Hansson, L. and Håkansson, H. E. V. A remark on the calculation of the Lamb shift, 3709
Hansson, N. An attempt to a photographic calibration of a tungsten ribbon lamp, 5365
Hanus, W. The torsional oscillator, 7562
Hanwick, T. J. and Hoffmann, P. O. Raman spectra of several compounds containing phosphorus, 6891
Happey, F. Fibre formation in synthetic polymers: methods and features, 6489. *See* Bamford, C. H., 3171, 5889
Hara, O. and Shimazu, H. On Yukawa's theory of non-local field, 5098
Hardebol, J. *See* Milatz, J. M. W., 7754
Harder, E. L. and Carleton, J. T. New techniques on the Anacom—electric analog computer, 2299
Harding, G. N. A scintillation counter for detecting fast neutrons, 5496
Harding, H. G. W. and Lambert, G. E. V. Colour and brightness of the sky, 6643
Harding, J. B. The origin of cosmic ray stars, 2811. Observation of cosmic ray events in nuclear emulsions exposed in a glacier at 3 550 m, 7057
Harding, W. R. *See* Gebbie, H. A., 3988
Hardtwig, E. Mathematical problems in geophysics, 3215
Hardy, H. C. *See* Callaway, D. B., 8589

Hargreaves, M. E. Modulated structures in some copper-nickel-iron alloys, 9018

Haringx, J. A. The rigidity of corrugated diaphragms, 1630

Harjes, F. W. *See* Martin, A. E., 7655

Harker, D. *See* Decker, B. F., 7083; Kaspar, J. S., 1500; Lucht, C. M., 7002

Harkins, W. D. Special and magic numbers as factors in nuclear stability and abundance, 541

Harms, W. *See* Cameron, A. G. W., 9708

Harned, H. S. *See* Gosting, L. J., 3857

Harnik, E., Herbstein, F. H. and Schmidt, G. M. J. X-ray crystallographic measurements on some compounds showing intramolecular overcrowding, 9170

Harnischmacher, E. *See* Eyfrig, R., 1536

Harper, A. F. A. *See* Jaeger, J. C., 1579

Harper, R. and Baron, M. The application of factor analysis to tests on cheese, 3265

Harper, S. Precipitation of carbon and nitrogen in cold worked alpha-iron, 8246

Harper, W. R. The volta effect as a cause of static electrification, 2658. Interpretation of experiments on frictional electrification, 4363

Harr, J. *See* Rose, M. E., 7249

Harrand, M. and Martin, H. Influence of substituents on the conjugation of double bonds and on the intensity of Raman spectra, 4296

Harrap, B. S. Adsorption of mixed films on activated carbon, 9086

Harrap, B. S. and Heymann, E. Theories of viscosity applied to ionic liquids, 9293

Harries, W. L. and von Engel, A. Influence of irradiation on the low frequency electrodeless discharge in chlorine, 5436

Harrington, V. J. Storage of small signals on a dielectric surface, 400

Harris, C. M. *See also* Stranks, D. R., 4812

Harris, C. M. and Feshbach, H. On the acoustics of coupled rooms, 167

Harris, C. W. Optical design by a matrix method, 2499

Harris, D. *See* Sun, K.-H., 5755

Harris, F. E. and Nash, L. K. Determination of traces of water vapor in gases, 8323

Harris, G. G. *See also* Rau, R. R., 466

Harris, G. G. and Shanley, T. J. B. On the μ-meson decay, 2061

Harris, G. M. Kinetics of isotropic exchange reactions, 9043

Harris, J. C. *See* Grove, G. R., 1304

Harris, J. E. *See* King, D. T., 4021

Harris, L., Beasley, J. K. and Loeb, A. L. Reflection and transmission of radiation by metal films and the influence of nonabsorbing backings, 8657

Harris, R. L. *See* Ritter, H. L., 3203

Harris, S. P. Neutron scattering cross sections of the noble gases, 1328

Harris, S. P., Hibdon, C. T. and Muehlhause, C. O. The neutron cross section of Mn below 5 000 eV, 3035

Harris, S. P., Muehlhause, C. O., Rasmussen, S., Schroeder, H. P. and Thomas, G. E. Pile neutron absorption cross sections, 2073

Harrison, F. B., Keuffel, J. W. and Reynolds, G. T. Capture of μ-mesons in heavy elements, 8227

Harrison, F. B. and Reynolds, G. T. Spectral emission from scintillation solutions and crystals, 221

Harrison, G. R. and Archer, J. E. Interferometric calibration of precision screws and control of ruling engines, 7576

Harrison, G. R., Lord, R. C. and Loofbourow, J. R. Practical spectroscopy, 176

Harrison, V. G. W. and Poulter, S. R. C. Gloss measurement of papers—the effect of luminance factor, 6142

Harrison, W. *See* Winch, G. T., 1782

Hart, E. J. Radiation chemistry of ferrous sulfate solutions, 5873

Hart, E. W. *See* Watson, K. M., 88

Hart, R. J., Russel, K. and Steffen, R. M. Quantum efficiency of bismuth counters for electromagnetic radiation of 0·07 MeV to 2·8 MeV energy, 5488

Hart, R. W. Sound scattering of a plane wave from a nonabsorbing sphere, 5204

Hart, R. W. and Montroll, E. W. On the scattering of plane waves by soft obstacles. I. Spherical obstacles, 4312

Hart, R. W., Wallis, F. and Pode, L. The superposition approximation in statistical mechanics of compressed gases, 4354

Harteck, P. Quantum theory in chemistry, 5845. *See also* Beyerle, K., 5678; Faltings, V., 761, 5681; Groth, W., 5680

Harteck, P. and Faltings, V. The helium-3 problem of the atmosphere, 3232

Harteck, P. and Melkonian, G. A. Occurrence of tunnel effect during adsorption and desorption of isotopes of hydrogen, 2145

Hartig, H. E. and Lambert, R. F. Attenuation in a rectangular slotted tube of (1, 0) transverse acoustic waves, 4185

Hartley, G. E. W. The development of electrical anemometers, 759, 9195

Hartman, C. D. *See* Molnar, J. P., 1746

Hartman, L. *See* Fieldes, M., 8364

Hartman, P. and Wintner, A. On the maxima of the Patterson functions, 3923

Hartman, R. E. The polarimetric determination of the ratio of complex reflection coefficients, 4304

Hartmann, H. and Becker, F. Quantum mechanical calculation of the polarizability of the hydrogen molecule, 9628

Hartridge, H. The retinal receptors, 2241. Macular pigments, 2243

Hartshorne, N. H. and Roberts, M. H. Studies in polymorphism. IV. A further investigation of the linear rate of transformation of monoclinic into rhombic sulphur, 5905

Hartsough, W. *See* Powell, W. M., 3551

Hartzler, A. J. Nuclear interactions in gold of secondary particles emitted in penetrating showers, 5521. *See also* Gottlieb, M. B., 434

Harvalik, Z. V. An electronic image converter and its use in chromatography, 728

Harvalik, Z. V. and Bowen, J. H. Subjective spectral band limits under controlled conditions, 2247

Harvey, B. G. *See also* Hanna, G. C., 4646, 4735, 4746

Harvey, B. G. and Parsons, B. I. Preparations of Th^{235} and Pa^{235}, 4641

Harvey, F. K. *See* Kock, W. E., 9352

Harvey, J. A. Neutron binding energies from (d, p) reactions and nuclear shell structure, 4711. *See also* Boyer, K., 5474; Gove, H. E., 5740

Harvey, R. A. *See* Laughlin, J. S., 7438

Harvey, R. L., Hegyi, I. J. and Leverenz, H. W. Ferromagnetic spinels for radio frequencies, 1179

Harwell, K. E. *See* Frampton, V. L., 7911

Harwood, H. D. and Shorter, D. E. L. A high-level noise source for the audio-frequency band, 304

Haseda, T. *See also* Kanda, E., 4160

Haseda, T., Ôtsubo, A. and Kanda, E. Specific heat of amorphous state, 4351

Hasegawa, M. A suggestion for the electric conductivity of the upper atmosphere from an analysis of the diurnal variations of terrestial magnetism, 6651

Haselden, G. G., Newitt, D. M. and Shah, S. M. Two-phase equilibrium in binary and ternary systems. V. Carbon dioxide-ethylene; VI. Carbon dioxide-propylene, 9756

Hashimoto, H. On the subsonic flow of a compressible fluid past a Rankine ovoid, 8578

Hasiguti, R. R. and Hirai, T. Internal friction of cold worked single crystals of copper, 9040

Hasimoto, Z. *See* Tomotika, S., 869

Haskell, N. A. Asymptotic approximation for the normal modes in sound channel wave propagation, 2462. Diffraction effects in the propagation of compressional waves in the atmosphere, 4006

Haskins, J. F. and Hickman, J. S. A derivation and tabulation of the piezoelectric equations of state, 143

Haslam, R. N. H. *See also* Johns, H. E., 3021; Katz, L., 5770

Haslam, R. N. H., Johns, H. E. and Horsley, R. J. Cross section for the reaction $C^{12}(\gamma, n)C^{11}$, 5769

Haslam, R. N. H., Katz, L., Moody, H. J. and Skarsgard, H. M. Decay scheme of Cl^{39}, 1996

Haslam, R. N. H. and Skarsgard, H. M. Gamma-alpha-reaction in Rb^{87}, 5761

Hass, G. *See* Benson, N. C., 2083

Hasted, J. B. The exchange of charge between ions and atoms, 3577

Hasted, J. B., Haggis, G. H. and Hutton, P. The dielectric dispersion of dioxan-water mixtures, 8718
Hastings, J. *See* Weiss, R. J., 9006
Hastings, J. M. *See* Katcoff, S., 5696
Hatch, D. *See* Parker, R. C., 1384
Hatch, T. F. *See* Brown, J. H. U., 4978
Hatfield, M. R. *See* Wall, F. T., 5892
Hatfield, P. Propagation of low frequency ultrasonic waves in rubbers and rubber-like polymers, 165
Hatfield, T. N., Lockenvitz, E. A. and Young, J. M. The specific ionization curves for hydrogen and deuterium, 1141
Hatton, J. *See also* Darby, J., 268, 324
Hatton, J., Rollin, B. V. and Seymour, E. F. W. Superconductivity of lead sulphide, 7906. Nuclear magnetic resonance measurements on Be^9, Al^{27}, and Si^{29}, in beryl, 8130
Hattori, A. On the reversal of absorption lines to the emissions at the extreme limb of the sun, 8459
Hauer, A. A new recording raingauge, 3970
Hauffe, K. Lattice defect phenomena and diffusion processes in semi-conducting mixed phases, 3518
Haug, A. Resonance phenomena in controlled low pressure mercury arcs, using ultra short waves, 343
Haul, R., Rust, H. H. and Lützow, J. Acceleration [in the attainment] of the distribution according to the Nernst distribution law by ultrasonic waves, 2423
Haul, R. and Theron, J. J. A low temperature thermostat, 7823
Haul, R. A. W. *See* Wilsdorf, H. G. F., 7391
Haupt, L. M. Solution of simultaneous equations through use of the A.C. network calculator, 10
Hauptman, H. *See also* Karle, J., 3921
Hauptman, H. and Karle, J. Relations among the crystal structure factors, 1490. A geometric approach to the crystal structure problem, 1493. Multiplicity of solutions of crystal-structure equations, 9135
Hauser, E. A. Modern colloidchemical concepts of the phenomenon of coagulation, 9073. *See also* Michaels, A. S., 7597
Hautot, A. The processes of latent image formation, 8416
Haven, Y. On the theory of ionic conductivity in crystals, 735. The ionic conductivity of Li-halide crystals, 1482
Havens, W. W., Jr. *See also* Block, M. M., 7292; Bramson, H., 8993; Passman, S., 7293; Tittman, J., 3777
Havens, W. W., Jr and Rainwater, L. J. Slow neutron velocity spectrometer studies. IV. Au, Ag, Br, Fe, Co, Ni, Zn, 9735
Havlicek, F. I. A nomogram for estimating the optimum aperture of optical systems, 6825
Haward, R. N. and Simpson, W. The effect of different catalysts on the polymerization of styrene, 4837
Hawes, R. C. and Gallaway, W. S. Principles of infrared spectrophotometry, 3429
Hawkes, D. H. and Laws, J. M. An electrical method of resolving true wind velocity aboard ship, 1533, 9197
Hawkins, G. S. *See also* Aspinall, A., 5989
Hawkins, G. S. and Almond, M. Bečvář's meteor stream, 1949, 802
Hawkins, J. A. *See* Durham, G. S., 4771
Hawkins, J. C. A strain gauge dynamometer rig for the determination of soil force on plough bodies, 100
Hawkins, R. C. *See* Yaffe, L., 6468
Hawksley, P. G. W. The physics of particle size measurement. I. Fluid dynamics and the Stokes diameter, 9738
Haworth, F. E. Experiments on the initiation of electric arcs, 1077. Electrode reactions in the glow discharge, 5431
Hawthorne, W. R. Secondary circulation in fluid flow, 5144
Haxel, O. *See also* Biermann, L., 5029; Houtermans, F. G., 3726
Haxel, O., Jensen, J. H. D. and Suess, H. E. Significance of special (magic) numbers of nucleons in nuclear structure in terms of a model, 538
Hayakawa, S. Interaction of mesons with nuclei, 6746. Nuclear interaction of μ-mesons underground, 9684. *See also* Aidzu, K., 5120; Fujimoto, Y., 5537, 7254; Fukuda, H., 3045, 5796
Hayakawa, S., Mano, K. and Miyazima, T. Cosmic-ray underground. I, 452; III, 5539
Hayakawa, S. and Nishura, J. Interpretation of the second maximum of Rossi curve, 5524
Hayase, K. *See* Sudo, T., 5899
Hayashi, I. *See* Kumagai, H., 7097, 9600
Hayashi, M. and Katsuki, K. Absorption spectrum of cuprous oxide, 1737
Hayashida, T. *See* Isihara, A., 6067–8
Haymond, H. R. *See also* Gile, J. D., 5751; Miller, J. F., 1870
Haymond, H. R., Garrison, W. M. and Hamilton, J. G. Carrier-free radioisotopes from cyclotron targets. XII. Preparation and isolation of Be^7 from lithium, 2996; XV. Preparation and isolation of Mn^{52} from chromium, 4701
Haynes, J. R. and Shockley, W. The mobility and life of injected holes and electrons in germanium, 4381. The mobility of electrons in silver chloride, 6959
Haynes, S. K. *See also* Thomas, D. A., 7216
Haynes, S. K. and Wedding, J. W. The use of three long rectangular coils for neutralization of the earth's magnetic field in a lens-type beta-ray spectrometer, 4441
Hayward, E. *See* Crowe, K. M., 1095
Hazard, C. *See* Brown, R. H., 1576
Hazel, F. *See* Stericker, W., 1753
Hazel, J. F. and Schipper, E. Low temperature studies with colloidal silicic acid, 4858
Hazen, W. E. *See* Randall, C. A., 454, 3604
Hazzard, G. W. Suggestions for the improvement of physics teaching in colleges and universities, 9253
Head, A. K. *See* Wood, W. A., 5834
Healey, F., Jr. *See* Stern, K. H., 9441
Heaps, C. W. Magnetoresistance of bismuth at 3 000 megacycles, 2877
Heath, D. F. *See* Linnett, J. W., 8090
Heavens, O. S. Measurement of the thickness of thin films by multiple-beam interferometry, 6144. *See also* Ginsborg, B. L., 5817
Hebb, M. H. Mechanism of exciton-enhanced photoelectric emission in alkali halides, 4392
Heber, G. On the question of the magnetic moments of nucleons. I, 8895; II, 8896
Hecker, W. *See* Schmitz, G., 4401
Heckmann, O. Theory and practice in cosmology, 5982
Heckmann, O., Jordan, P. and Fricke, W. On the extended theory of gravitation. I, 4076
Hedberg, K. The infrared spectra of Cl_2O and ClO_2, 5285
Hedberg, K. and Badger, R. M. The infrared spectra of HOCl and DOCl, 5284
Hedgran, A. Energy of the ThC″ 2·62 MeV gamma-ray, 6438. *See also* Bishop, G. R., 1307, 4723
Hedgran, A. and Lind, D. A. The discrepancy in the energy of annihilation radiation and the possibility of electron-positron mass difference, 6442
Hedgran, A. and Thulin, S. On the radioactivity of Hf^{181} and Hf^{175}, 6434
Hedrick, L. C. Synchronizer for 100-kc square wave generator, 7665
Heel, A. C. S. van. *See* van Heel, A. C. S.
Heer, C. V. and Daunt, J. G. A contribution to the theory of Bose–Einstein liquids, 4344
Heer, I. de. *See* de Heer, I.
Heerden, P. J. van. *See* van Heerden, P. J.
Heerschap, M., Ong Ping Hok and Sizoo, G. J. The beta-radiations of UX$_1$ and UX$_2$, 2966
Hegyi, I. J. *See* Harvey, R. L., 1179
Heide, H. G. A modified Lorentz factor for the rotating crystal method, 2170. On the Lorentz factor for rotating-crystal [X-ray] photographs, 6575
Heidmann, J. Production of fast deuterons in the collision of fast nucleons with a nucleus, 629. The production of high energy deuterons by energetic nucleons bombarding nuclei, 1311
Hein, C. C. and Hickam, W. M. Carbon, oxygen, and sulfur content of Chilean coppers as related to cuprous-oxide rectifiers, 9476
Hein, R. E. and Voigt, A. F. Radioactive isotopes of gadolinium, 567
Heindl, C. and Ruderman, I. W. Neutron resonances of tellurium, 9730
Heine-Geldern, R. von. *See* von Heine-Geldern, R.

Heinrich, G. Föppl's theory of rolling friction, 2114. Study of the motion of a Fleuriais gyroscope, 7573

Heinrich, G. and Klemenc, A. An investigation of diffusion processes in the atmosphere, 3981

Heins, A. E. The reflection of an electromagnetic plane wave by an infinite set of plates. III, 3422

Heintze, J. *See* Houtermans, F. G., 3726

Heise, F. Stereoscopy with the electron microscope, 3565

Heisenberg, W. Stationary states in the relativistic quantum theory of wave-fields, 65. Meson formation in multiple processes, 472. On the quantum theory of elementary particles, 835. Fifty years of quantum theory, 4081. The Yukawa theory of nuclear forces in the light of present quantum theory of wave fields, 5068. On the question of causality in the quantum theory of elementary particles, 7549. On the mathematical frame of the theory of elementary particles, 9263

Heiskanen, W. On the isostatic structure of the earth's crust, 1521

Heitler, W. *See also* Bleuler, K., 5077

Heitler, W. and Janossy, J. The multiplicities of meson-showers and the absorption of meson-producing nucleons, 473

Hela, I. On the periodicity of the recent changes in our climate, 6642

Helaine, A., Le Montagner, S. and Le Bot, J. Determination with centimetre waves of the dielectric constant of substances in the compact state from the dielectric constant of the powder, 3505

Hellar, R. A. *See* Widell, F. G., 405

Heller, B. and Veverka, J. Ionization processes in solid insulators, 1142

Heller, G. S. *See* Keck, W., 5199

Heller, J. Covariant transformation law for the field equations, 5074

Heller, R. The position of the nodes of the transverse vibrations of uniform thin fixed-free bar, 5173

Heller, R. B. *See also* Burgy, M., 3054

Heller, R. B., McGannon, J. and Weber, A. H. Precision determination of the lattice constants of zinc oxide, 1502

Heller, R. B., Sturcken, E. F. and Weber, A. H. Transmission of beta-rays by nylon and formvar, 2748. The beta spectrum of S^{35} using window corrections, 8932

Heller, W. and Thompson, A. C. The volume requirements of polymer molecules. I. The apparent specific volume of polystyrene in solution, 9097

Helliwell, R. A., Mallinckrodt, A. J. and Kruse, F. W., Jr. Fine structure of the lower ionosphere, 6634

Hellmann, M. *See* Roe, A., 5853

Hellmig, E. The calculation and exposition of the concentration and luminescence diagrams for practical purposes, 5337. Nomograms for the transformations between the CIE and MacAdam's u, v chromaticity charts, 5339

Hellstrand, E. *See* Grimeland, B., 8205

Hellwege, K. H. Optical anisotropy of cubic crystals under quadrupole radiation, 7369

Hellwege, K. H. and Kahle, H. G. Spectrum and structure of crystalline europium salts. I. Europium chloride $EuCl_3 . 6H_2O$, 4254. II. Europium bromate $Eu(BrO_3)_3 . 9H_2O$, 4255

Helmholz, A. C. *See* Bartell, F. O., 3015

Helwig, G. *See* König, H., 8252

Hély, J. The classifying of atomic nuclei occuring in nature, 4617

Hemenway, C. L. and Dunnington, F. G. A new determination of h/e, 1138

Hemmendinger, A. *See* Jarvis, G. A., 608

Hemptinne, M. de. *See* de Hemptinne, M.

Henderson, C. The application of Boltzmann's superposition theory to materials exhibiting reversible β flow, 3830

Henderson, I. H. S. *See* Danby, C. J., 8302

Hendricks, J. O. *See* Dahlquist, C. A., 9026

Heney, J. *See* Goldstein, L., 7126, 8853

Henisch, H. K. Internal barriers in semi-conductors, 7876

Henisch, H. K. and Ewels, J. A study of electrical forming phenomena at selenium contacts, 1055

Henisch, H. K. and François, M. Semi-conducting materials. On the thermo-electric properties of selenium, 7886

Henisch, H. K. and Granville, J. W. Semi-conducting materials. Recent experiments on lead sulphide contacts, 7861

Henkel, R. L. and Barschall, H. H. Capture cross sections for fast neutrons, 1310

Henkels, H. W. Electrical properties of selenium: I. Single crystals, 6975

Henley, E. M. and Huddlestone, R. H. On the production of π^+ mesons in carbon, 8220

Hennig, G. The properties of the interstitial compounds of graphite. I. The electronic structure of graphite bisulfate, 7301

Henry, A. F. Hyperfine structure of Zeeman levels in nitric oxide, 1724. The Zeeman effect in oxygen, 1960

Henry, C. O. *See* Sidhu, S. S., 753

Henry, G. D'. *See* D'Henry, G.

Henry, R. Measurement of the pumping speed of sliding-vane pumps, 882

Henry, W. G. *See also* Jaswon, M. A., 3677

Henry, W. G., Jaswon, M. A. and Raynor, G. V. The cohesion of alloys. II. Some general metallurgical implications, 3678

Henry, W. G. and Raynor, G. V. The cohesion of alloys. III. Extension to high solute concentrations, and application to the alloys of group IA metals, 3679

Henry, W. H. and Keys, J. D. Pulser for cyclotron oscillator, 8782

Henshaw, D. G. *See* Jackson, L. C., 1018

Hensley, E. B. and Affleck, J. H. The barium oxide on tungsten cathode interface, 407, 4491

Henson, A. F. A modification of the radiofrequency mass spectrometer, 378

Hentz, R. R. and Burton, M. Studies in photochemistry and radiation chemistry of toluene, mesitylene and ethylbenzene, 5867

Henvis, B. W. *See* Burstein, E., 5900

Hepner, W. A. A canonical transformation in the theory of particles of arbitrary spin, 4030

Herbert, G. *See* Walchli, H., 5664

Herbstein, F. H. A simple method of applying the rotation factor correction in equi-inclination Weisenberg photographs, 3917. *See also* Harnik, E., 9170

Hercus, G. R. and White, G. K. A medium capacity helium liquefier, 2628

Herczeg, C. *See* Berthelot, A., 3738

Hereford, F. L. The angular correlation of photo-electrons ejected by annihilation quanta, 4681. Directional distribution of photo-electrons ejected by polarized quanta, 4682

Herington, E. F. G. Applications of the electronic spectra of pyridine homologues to quantitative analysis and to the measurement of dissociation constants, 8327

Hérisson, M. *See* Lenormant, H., 5276

Herlin, M. A. *See* Maurer, R. D., 4343; Rorschach, H. E., 4376

Herlofson, N. Plasma resonance in ionospheric irregularities, 7132

Herman, F. *See* Moore, A. R., 4378

Herman, J. A. *See* Mund, W., 8304

Herman, L. *See* Herman, R., 6114

Herman, R. *See also* Weniger, S., 5253, 7674

Herman, R., Weniger, C. and Herman, L. Emission of the forbidden oxygen lines by molecular dissociation, 6114

Herman, R. C. *See also* Alpher, R. A., 2312, 9682; Hornbeck, G. A., 5263

Herman, R. C., Hornbeck, G. A. and Laidler, K. J. Kinetic mechanisms and hydrocarbon flame spectra, 1723

Herman, R. C. and Shaffer, W. H. The vibration-rotation energies of the plane symmetrical $X_2Y_2X_2$ molecular model, 528

Hermans, J. J. and Levinson, S. Some geometrical factors in light-scattering apparatus, 6901

Hermansen, A. A method for production of interference filters for specified wave-lengths, 3464

Herndon, L. R., Jr. *See* Barrett, E. W., 4936

Hernqvist, K. G. *See* Linder, E. G., 369

Herpin, A. *See* Delourmel, T., 8867

Herrick, S. Space rocket trajectories, 102

Herring, C. Some theorems on the free energies of crystal surfaces, 4900. Correlation energy and the heat of sublimation of lithium, 5629

Herring, C. and Kittel, C. On the theory of spin waves in ferromagnetic media, 4525

Herriott, D. R. *See* Epstein, L. I., 1007

Hershberger, W. D. *See* Hurd, F. K., 5279

Hertz, H. A magnetic scaling circuit, 2770

Herwig, L. O. Photoelectric control circuits for the ion source of a pressure-type electrostatic generator, 9555

Herz, R. H. Ionometric half value layer meter for measurements of the quality of X-rays, 8765

Herzberg, G. Rotation-vibration spectrum of the HD molecule, 204. Molecular spectra and molecular structure. I. Spectra of diatomic molecules (second edition), 2502. The atmospheres of the planets, 7460. *See also* Cowan, R. D., 2546, 6875; Douglas, A. E., 8624

Herzberg, G. and Herzberg, L. Rotation-vibration spectra of diatomic and simple polyatomic molecules with long absorbing paths. VI. The spectrum of nitrous oxide (N_2O) below $1 \cdot 2\mu$, 2548

Herzberg, G., Jones, A. V. and Leitch, L. C. The photographic infrared spectrum of CD_3CCH and the structure of methyl acetylene, 4274

Herzberg, G. and Reid, C. Infra-red spectrum and structure of the HNCO molecule, 7748

Herzberg, L. *See* Herzberg, G., 2548

Herzfeld, K. F., Maxwell, E. and Scott, R. B. Isotope effect and lattice properties in superconductivity, 323

Herzog, R. F. K. New information on the [paraxial] electron-optical properties of [homogeneous] magnetic [sector] prisms, 9517. *See also* Ehrenhaft, F., 335

Hess, D. C. *See* Inghram, M. G., 3730

Hess, J. B. A modification of the Cohen procedure for computing precision lattice constants from powder data, 6574

Hess, V. F. New studies on the radioactivity of the atmosphere, 9221

Hess, W. B., Swengal, R. C. and Waldorf, S. K. Measuring water velocity by an ultrasonic method, 1645

Hestenes, M. R. and Karush, W. A method of gradients for the calculation of the characteristic roots and vectors of a real symmetric matrix, 9224

Hett, J. H. A high-speed stereoscopic Schlieren system, 4992

Hettich, H. *See* Feldkeller, R., 3632

Heumann, H. *See* Claussnitzer, W., 2655

Hewish, A. The diffraction of radio waves in passing through a phase-changing ionosphere, 9621. *See also* Ryle, M., 3271

Hewitt, M. A. *See* Cook, G. B., 4461

Heydenburg, N. P. *See* Hudspeth, E. L., 2041; Phillips, G. C., 7263, 9689

Heyl, P. R. The limitations of the principle of superposition. I, 1765; II, 6796

Heyland, G. R. and Duncanson, W. E. Absorption of cosmic rays in lead, 7054

Heymann, E. *See* Harrap, B. S., 9293

Heywang, W. Reflection effects in the non-linear theory of superconductivity, 5419. On the effective field strength in cubic crystals, 7833

Hibbard, L. U. The Birmingham proton synchrotron, 1871

Hibbard, R. R. and Pinkel, B. Flame propagation. IV. Correlation of maximum fundamental flame velocity with hydrocarbon structure, 5357

Hibdon, C. T. Neutron cross sections at 120 and 345 Ev, 651. *See also* Harris, S. P., 3035

Hibdon, C. T., Muehlhause, C. O., Ringo, G. R. and Robillard, T. R. Scattering of thermal neutrons by mercury, 6483

Hibi, T. On the electron-optical observation of the emission patterns of barium-azide, barium oxide and strontium-oxide specks, 4488. Electric conductivity of semi-conductors, 6211. Thermionic emission of semi-conductors, 6291

Hibi, T. and Isikawa, K. On the method of determining the best operating condition of a fractionating oil diffusion pump, 4163. On the initial decay of oxide-coated cathodes, 7985. Thermionic emission from (Ba–Sr) O cathodes illuminated by the incandescent lamp, 8807

Hibi, T. and Matsumura, T. On the aggregation of trapping centres in semiconductors or insulators, 4383

Hiby, J. *See* Pahl, M., 561

Hickam, W. M. *See* Hein, C. C., 9476

Hickling, A. *See* El Wakkad, S. E. S., 1429

Hickman, J. S. *See* Haskins, J. F., 143

Hickman, K. Reverse separation in fractionation pumps, 4165

Hickman, R. E. B. Multiplier phototubes in scintillation counters, 1130

Hicks, H. F., Jr. *See* Babits, V., 1779

Hicks, H. G. *See* Wilkinson, G., 568, 2001, 4650

Higasi, K. Physical principles of ultra-short wave therapy and other high-frequency applications, 4975

Higatsberger, M. J. On a momentum-mass spectrograph, 6266. *See also* Ehrenhaft, F., 335

Higgins, G. C. *See* Jones, L. A., 4984–5, 5231

Higgins, H. G. and Plomley, K. F. Rheological changes during gel formation in adhesive systems, 1380

Higgins, T. J. An epitomisation of the basic theory of the Schwarz–Christoffel transformations as used in applied physics, 4993. *See also* Reitan, D. K., 2660, Van Bladel, J., 3665

Higinbotham, W. A. and Rankowitz, S. A combined current indicator and integrator, 9552

Hildebrand, J. H. An irregularity in the solvent powers of paraffins, 877. *See also* Powell, R. E., 8337; Rotariu, G. J., 7603

Hildebrand, J. H. and Rotariu, G. J. Supercooling of liquid phosphorus, 7809

Hildebrand, R. H. and Leith, C. E. Total cross sections of nuclei for 42-Mev neutrons, 3029

Hill, A. J. *See also* Sandage, A. R., 6700

Hill, A. J. and King, R. B. Relative *f*-values for lines of Cr I, 5268

Hill, F. K. *See* Faro, I. D. V., 2446

Hill, J. E. *See* Roberts, L. D., 1326

Hill, M. *See* Powell, W. M., 3551

Hill, R. A theory of the plastic bulging of a metal diaphragm by lateral pressure, 1371. On the state of stress in a plastic-rigid body at the yield point, 8267. *See also* Bishop, J. F. W., 5831

Hill, R. and Siebel, M. P. L. On combined bending and twisting of thin tubes in the plastic range, 8265

Hill, R. A. W., Sutton, L. E., Temple, R. B. and White, A. A study of slow self-propagating reactions in solids, 3115

Hill, R. D. Nuclear isomerism and shell structure, 1965. The absence of cross-over transitions in tellurium isomers, 4637. Radioactivity of cerium, 5726. An experimental electron accelerator, 6256. Disintegration of Sn^{119m}, 8945. *See also* Metzger, F. R., 5707; Mihelich, J. W., 595; Sherk, P. M., 8928

Hill, R. D. and Metzger, F. R. Nuclear isomers of Ba^{133} and Ba^{135}, 8947

Hill, R. M. and Smith, W. V. Microwave collision diameters and associated quadrupole moments, 5281

Hill, T. L. Concerning the dependence of the surface energy and surface tension of spherical drops and bubbles on radius, 113. Note on the physical adsorption of gases in capillaries and on small particles (nucleation of condensation), 2143. Liquid-vapour transition region and physical adsorption according to van der Waal's equation, 5880; Thermodynamics of adsorption, 9087. *See also* Drenan, J. W., 1665; Peek, H. M., 115

Hillenbrand, L. J., Jr and Kilpatrick, M. L. The thermal decomposition of nitromethane, 5852

Hillert, M. The time dependence of the sensitivity of photomultiplier tubes, 7901. Nuclear reaction radiography, 8419

Hillger, R. E. *See also* Eshbach, J. R., 2923

Hillger, R. E. and Strandberg, M. W. P. Centrifugal distortion in asymmetric molecules. II. HDS, 8101

Hillier, J. An objective for use in the electron microscopy of ultra-thin sections, 2743. On the sharpening of microtome knives for ultra-thin sectioning, 4324. *See also* Turkevich, J., 1402

Hillier, K. W. The variation of the dynamic elasticity of polythene with strain, 7315

Hills, A. A. Adaptation of a chemical balance for precision weighing, 9292

Hills, G. J. and Ives, D. J. G. The hydrogen-calomel cell. I. The hydrogen electrode, 4841; II. The calomel electrode, 4842; III. The standard e.m.f. at 25°c, 4843

Hilsch, R. *See* Buckel, W., 319

Hilsum, C. *See* Gebbie, H. A., 3988

Hilton, W. A. and Ham, L. B. Acoustical impedance and absorption coefficients, 2470

Himpan, J. The electron optical theory of the deflection of an extensive electron optical picture by means of a crossed electrical deflection system, 6259

Hinde, R. M. *See* Taylor, C. A., 6579

Hindman, J. V. *See* Christiansen, W. N., 5026, 5990; Piddington, J. H., 804

Hine, G. J. Response of G-M counters and photographic emulsions, to high-energy photons, 1878. Scattering of secondary electrons produced by γ-rays in materials of various atomic numbers, 6262

Hine, G. J. and Senftle, F. E. Neutron yield from Be^9(γ, n)Be^8 reaction, 3019

Hines, C. O. Wave packets, the Poynting vector, and energy flow: I. Non-dissipative (anisotropic) homogeneous media, 6366; II. Group propagation through dissipative isotropic media, 8060; III. Packet propagation through dissipative anisotropic media, 8061

Hines, E. *See* Gemant, A., 4628

Hinshelwood, C. *See* Bardwell, J., 3496, 7330

Hinshelwood, C. N. The structure of physical chemistry, 8280

Hintenberger, H. The aperture defect in the ion-optical imaging of a point by means of an arbitrarily bounded magnetic field, 7947

Hintz, N. M. Excitation functions with an internal cyclotron beam, 8187

Hippel, A. von. *See* von Hippel, A.

Hipple, J. A. *See* Gorman, J. G., 4885; Sommer, H., 2913, 5381

Hirabayashi, M. Existence of superlattice CuAu$_3$, 6485

Hirai, T. *See* Hasiguti, R. R., 9040

Hirone, T. and Ogawa, S. On the discontinuous displacement of magnetic domain boundary of the ferromagnetic substance due to tension, 8047

Hirone, T., Ogawa, S. and Huzimura, T. On the large Barkhausen jump and the internal stress in Perminvar wire, 8046

Hirone, T. and Tsuya, N. On the origin of magnetism in iron sulphides with various sulfur contents, 9594

Hirone, T., Watanabe, H., Mizuno, J. and Tsuya, N. On the ferromagnetic resonance absorption in magnetite single crystals at 9 400 Mc and 4 560 Mc, 8028

Hirsch, J. *See* Ehrenberg, W., 7881

Hirsch, P. B. A micro-beam technique applied to the study of cold-worked metals, 2722. *See also* Gay, P., 6252, 8250, 9130

Hirsch, P. B. and Kellar, J. N. An X-ray micro-beam technique: I. Collimation, 6251

Hirschfelder, J. O. *See also* Bird, R. B., 899; Buehler, R. J., 4175, 7350; Curtiss, C. F., 2891; Spotz, E. L., 9781; Wentorf, R. H., Jr, 2648

Hirschfelder, J. O. and Curtiss, C. F. The theory of flame propagation. II, 9764

Hirsh, I. J. Pathology in speech communication, 1695

Hirshberg, Y. Photochromism in the bianthrone series, 1783

Hirshfeld, H. L. *See* Frei, E. H., 4437

Hirst, F. *See* Dunbar, D. N. F., 7261

Hirt, R. C. *See* Halverson, F., 6865

Hirtz, J. *See* Bernard, H., 7354

Hiskey, C. F. *See* Post, B., 697

Hjalmar, E. *See* Slätis, H., 4695, 8958

Hjalmars, S. *See* Brulin, O., 6023

Hoang, T.-F., The heavy primary nuclei of cosmic rays, 1150. Thinning-down effect in nuclear photographic tracks, 6271

Hoang, T.-F. and Morellet, D. On the thinning down of the tracks of heavy nuclei in the photographic emulsion, 2279

Hoang Tchang-Fong. *See* Hoang, T.-F.

Hoar, T. P. *See* Atterton, D. V., 6064; Bowen, K. W. J., 493

Hoarau, J. *See* Pacault, A., 8017

Hoard, J. L. *See also* Geller, S., 9168, 9172; Owen, T. B., 3943

Hoard, J. L., Geller, S. and Cashin, W. M. Structures of molecular addition compounds. III. Ammonia-boron trifluoride, H$_3$N–BF$_3$, 9171

Hoard, J. L., Geller, S. and Owen, T. B. Structures of molecular addition compounds. V. Comparison of four related structures, 9173

Hoare, F. E. and Walling, J. C. An absolute measurement of the susceptibility of tantalum and other metals, 5575

Hoare, M. F. *See also* Grove, J. R., 259; Linnett, J. W., 4826

Hoare, M. F. and Linnett, J. W. The homopolar bond in the hydrogen molecule, 2896

Hocart, R. J. *See* Monier, J. C., 1006

Hoch, H. Reference wedge for *Schlieren* diagrams, 243

Hoch, M. *See* Elser, K., 5169

Hochanadel, C. J. *See* Ghormley, J. A., 8307

Höcker, K. H. *See* Schopper, E., 6310–11

Hodge, P. G., Jr. Approximate solutions of problems of plane plastic flow, 677

Hodgdon, F. B. and Stuart, D. A. The application of rate-process theory to glass. II. Viscosity, 684

Hodgdon, F. B., Stuart, D. A. and Bjorklund, F. E. The application of rate-process theory to glass. I. Breaking strength, 683

Hodgkin, D. C. *See* Cowan, P., 3942

Hodgson, P. E. The emission of Li^8 from cosmic ray induced nuclear disintegrations, 2813. The disintegration of lead nuclei by cosmic rays, 2814. The disintegration of light nuclei by cosmic rays, 9583. *See* Thomson, G., 9580

Hodson, A. L. and Loria, A. Control of a Wilson cloud chamber by means of an internal counter, 397

Hoecker, F. E. *See* Miller, B. L., 8154

Hoeppel, R. W. A continuous flow, high temperature viscosimeter for drilling muds, 4139

Hoerlin, H. Quantum yield of the photographic effect of X-rays as a function of wavelength and sensitization, 9900

Hoerni, J. Diffraction of electrons by graphite, 3806

Hofe, C. von. *See* von Hofe, C.

Hofer, L. J. E. *See also* Manes, M., 1395

Hofer, L. J. E. and Peebles, W. C. X-ray diffraction patterns of solid aromatic hydrocarbons, 8331

Hoff Lu. Phenomenological theories of bulk viscosity, 4162. Volume viscosity and compressibilities from acoustic phenomena, 4192

Hoff, R. W., Rasmussen, J. O. and Thompson, S. G. Neutron deficient europium and gadolinium isotopes, 9657

Hoffleit, D. The discovery and exploitation of spectroscopic parallaxes, 6001

Hoffman, C. J. *See* Gutowsky, H. S., 4601

Hoffman, F. de. *See* de Hoffman, F.

Hoffman, F. J. *See* Gutowsky, H. S., 1976

Hoffman, J. I. *See* Craig, D. N., 1814

Hoffman, R. E. and Turnbull, D. Lattice and grain boundary self-diffusion in silver, 5815; Erratum, 7307

Hoffmann, A. An oscillograph method for the investigation of barrier-layer properties of metal rectifiers, 306. On the forming processes in selenium rectifiers containing thallium, 1054

Hoffmann, P. O. *See* Hanwick, T. J., 6891

Hoffmann, T. A. and Kónya, A. Some investigations in the field of the theory of solids. I. Linear chain of similar atoms, 7143

Hoffmeister, C. Interplanetary matter, 7459

Hofreiter, N. *See* Gröbner, W., 3250*.

Hofstadter, R. *See also* West, H. I., Jr, 3591

Hofstadter, R. and McIntyre, J. A. Gamma-ray spectroscopy with crystals of NaI(Tl), 2020. Measurement of gamma-ray energies with single crystals of NaI(Tl), 2021

Hofstadter, R., McIntyre, J. A., Roderick, H. and West, H. I., Jr. Detection of slow neutrons, 6481

Hogan, A. W. Use of image converter tube for high-speed shutter action, 4991. Use of image phototube as a high-speed camera shutter, 9890

Hogarth, C. A. Hall constant of cadmium oxide, 6370. Some conduction properties of the oxides of cadmium and nickel, 7880. *See also* Banbury, P. C., 7889; Granville, J. W., 6968

Hogarth, J. E. Polarization of the *Z*-trace, 7131

Hoge, H. J. Compilation of thermal properties of wind-tunnel and jet-engine gases at the National Bureau of Standards, 252. A resistance-temperature relation for low temperature thermometry, 1811. *See also* Arnold, R. D., 878

Högfeldt, E. *See* Ekedahl, E., 1446, 6543

Hogg, A. R. Some time variations of cosmic rays, 2797

Höhler, G. On the theory of generalised wave-equations, 8529. An example on classical field mechanics, 8530

Hok Ping Ong. *See* Ong Ping Hok.

Holden, A. V., Levenson, G. I. P. and Wells, N. Developers for hot-drum processing machines, 9891

Holden, J. The shape of reflected interference fringes from interferometers coated with thin metal films, 7781

Holden, R. B., Taylor, W. J. and Johnston, H. L. A variable thickness low temperature infra-red cell, 1730

Hole, N. The determination of the decay constant of a radioactive source. I, 9659; II, 9660

Holiday, E. R. *See also* Beaven, G. H., 9379

Holiday, E. R. and Wild, W. An image converter to extend the useful range of photo-multipliers to longer wavelengths, 8741

Holland, F. A., Huggill, J. A. W. and Jones, G. O. The solid-fluid equilibrium of helium above 500 atm. pressure, 6168

Holland, L. The production, properties and uses of thin films condensed in vacuo, 4781

Holland, S. S., Jr. *See* Sperduto, A., 3009

Hollander, J. M. and Leininger, R. F. On the half-life of actinium, 2954

Holle, W. The objective measurement of loudness particularly of machinery noise, 7646

Holler, H. D. Studies on galvanic couples. I. Measurement of electromotive force and internal resistance of cells during current flow, 700; II. Some potential-current relations in galvanic corrosion, 701. Some electrical relations in galvanic couples, 3146

Holleran, E. M. and Hulburt, H. M. Transport properties of gases with a square-well molecular interaction potential, 4173

Hollis-Hallett, A. C. Oscillating disc experiments in liquid helium ii, 2625

Holloway, A. F. *See* Sinclair, W. K., 4640

Holm, R. The electric tunnel effect across thin insulator films in contacts, 5447; Erratum, 9511

Holmberg, E. A photometric study of nearby galaxies, 1586. On the luminosity function of type I stars, 1587

Holmes, D. K. *See* Rose, M. E., 7236

Holmes, J. R. Isotope shifts in some lines of carbon and nitrogen, 6109

Holmes, O. G. *See* McCallum, K. J., 9776

Holroyd, L. V. *See also* Mrowca, B. A., 1460

Holroyd, L. V., Codrington, R. S., Mrowca, B. A. and Guth, E. Nuclear magnetic resonance study of transitions in polymers, 6550

Holroyd, L. V., Mrowca, B. A. and Guth, E. Study of high polymers by nuclear magnetism. I. Line widths at room temperature, 1459

Holstein, T. Imprisonment of resonance radiation in gases. II, 9387. *See also* Biondi, M. A., 7281

Holt, R. B. *See* Dandurand, P., 5443, 6995; Johnson, R. A., 1865; Meadows, J. W., 7260; Redfield, A., 6996; Richardson, J. M., 3541

Holtan, H., Jr. On the energetic treatment of non-isothermal processes. The principle of thermal interaction, 5846

Holte, G. On the space energy distribution of slowed-down neutrons, 4760; II, 6479

Holtsmark, J. A remark on the theory of optical images, 9358. On the calculation of optical images, 9359

Holtzman, R. B. *See* Sheline, R. K., 8914

Homès, G.-A. and Gouzou, J. A contribution to the study of the mechanisms of rupture in metals, 1366

Honerjäger, R. Microwave spectroscopy, 5267

Honerjäger, R. and Schulz-Du Bois, E. A microwave method of measurement of electron concentrations in the plasma of a glow discharge, 351

Hones, E. W. *See* Lewis, H. W., 4467

Honeycombe, R. W. K. A simple method of X-ray microscopy and its application to the study of deformed metals, 9017

Honick, K. R. A null method mercury cistern manometer, 5141

Honig, R. E. A greaseless gas flow valve, 4164

Honjo, G. and Mihama, K. Fine structure of electron-diffraction spots due to particle shape and to the method of shadow-casting, 7310

Hönl, H. and Boerner, H. On de Broglie's theory of elementary particles, 90

Honnell, P. M. The application of feedback to an electromechanical transducer for seismograph testing, 1524. The absolute calibration of a brush accelerometer and its response to square waves of displacement and velocity, 3216

Hood, J. D. *See* Hallpike, S. C., 5956

Hoof, A. van. *See* van Hoof, A.

Hook, A. Van. *See* Van Hook, A.

Hooper, J. E. and King, D. T. Multiple processes in the production of pairs of electron by γ-radiation, 1296

Hooper, J. E., King, D. T. and Morrish, A. H. On pair production by fast electrons, 3740

Hooper, J. E. N. *See* Jones, F. E., 2196, 9192

Hoover, C. R. Development of an optical radar system for surveying purposes, 862

Hopper, V. D. and Biswas, S. Evidence concerning the existence of the new unstable elementary neutral particle, 3793

Hopkins, H. H. Wave theory of aberrations, 4228. The concept of partial coherence in optics, 7782

Hopkins, H. H. and Barham, P. M. The influence of the condenser on microscopic resolution, 247

Hopkins, I. L. Dynamic shear properties of rubberlike polymers, 3819

Hopkins, J. I. Electron energy studies with the anthracene scintillation counter, 4470

Hopkins, M. R. and Toye, T. C. The determination of the viscosity of molten metals, 109

Horak, H. G. Diffuse reflection by planetary atmospheres, 2322

Horák, Z. and Krupka, F. Technical apparatus for determining thermal conductivity of steels up to 500°c, 1008

Horie, H. Excitation of atoms by electron collision. I, 8902

Horie, H., Umezawa, M., Yamaguchi, Y. and Yoshida, S. On the excited state of even nuclei, 8115

Horio, M. and Onogi, S. Dynamic measurements of physical properties of pulp and paper by audio-frequency sound, 7317. Forced vibration of reed as a method of determining viscoelasticity, 7318

Horio, M., Onogi, S., Nakayama, C. and Yamamoto, K. Viscoelastic properties of several high polymers, 7316

Hormats, E. I. and Van Artsdalen, E. R. Bromination of hydrocarbons. IV. Photochemical and thermal bromination of neopentane in the gas phase. The C–H bond strength in neopentane, 7349

Horn, F. H. On asymmetric heat conduction in copper-copper oxide rectifiers, 9474

Horn, P., Benoit, H. and Oster, G. Study of the light scattered by a solution of anisotropic [uniform, thin and randomly oriented] rodlike particles, 5332

Hornbeck, G. A. *See also* Herman, R. C., 1723

Hornbeck, G. A. and Herman, R. C. The vibration-rotation bands of OH in the photographic infrared, 5263

Hornbeck, J. A. The mobilities of molecular and atomic rare gas ions in the parent gases: helium, neon and argon, 1891. Microsecond transient currents in the pulsed Townsend discharge, 6991

Hornbeck, J. A. and Wannier, G. H. Cross sections for ion/atom collisions in He, Ne and A, 5507

Hornbeck, J. W. Some reflections on the teaching of physics, 9254

Horne, M. R. The plastic theory of bending of mild steel beams with particular reference to the effect of shear forces, 6512

Hornig, D. F. Infra-red spectra of crystals at low temperatures, 7723. *See also* Greene, E. F., 4184; Lohman, J. B., 5269; Reding, F. P., 6382

Hornig, D. F., Hyde, G. E. and Adcock, W. A. A ratio-recording double-beam infra-red spectrophotometer with automatic slit-control, 177

Hornyak, W. F., Lauritsen, T., Morrison, P. and Fowler, W. A. Energy levels of light nuclei. III, 2911

Horsley, R. J. *See* Haslam, R. N. H., 5769

Horton, C. W. On the semiconductor bornite, 4384

HORTON, C. W. and KARAL, F. C., JR. On the diffraction of a plane sound wave by a paraboloid of revolution, 1681. On the diffraction of a plane electromagnetic wave by a paraboloid of revolution, 5602
HORTON, C. W., KARAL, F. C., JR and MCKINNEY, C. M. On the radiation patterns of dielectric rods of circular cross section—the $TM_{0,1}$ mode, 1197
HORTON, J. *See* FRANZEN, W., 2438
HORVÁTH, J. I. The theoretical treatment of the monosilan molecule, 533. A geometrical model for the unified theory of physical fields, 3315. Additions to the theory of the HCl molecule, 4580. Errata: Contributions to the theoretical treatment of ammonium. II, 7156
HOSELITZ, K. Recent progress in the field of permanent magnets, 7076
HOSELITZ, K. and MCCAIG, M. Theory of magnetic properties of anisotropic permanent magnetic alloys, 2831. Torque curves and other magnetic properties of Alcomax, 8042
HOSEMANN, R. The ideal paracrystal and its coherent X-ray scattering, 3198
HOSHINO, S. *See* SAWAGUCHI, E., 9835; SHIRANE, G., 3211, 3929
HOSLER, C. L. Preliminary investigation of condensation nuclei under the electron microscope, 2213
HOTCHIN, J. E. A particular impurity found in solutions of radioactive phosphorus, 9653
HOTCHKISS, R. N., WASHER, F. E. and ROSEBERRY, F. W. Spurious resolution on photographic lenses, 8612
HOTHERSALL, A. W. The structure of electrodeposited metals, 5810
HOUGH, P. V. C. On the photo-disintegration of the deuteron by lithium and fluorine γ-rays, 3022
HOUGHTON, H. G. An appraisal of cloud seeding as a means of increasing precipitation, 5939
HOUSEHOLDER, A. S. *See* SHEPPARD, C. W., 4958
HOUSTON, W. V. and MUENCH, N. Electromagnetic forces on a superconductor, 327
HOUTERMANS, F. G., HAXEL, O. and HEINTZE, J. The half-life of K^{40}, 3726
HOUTERMANS, F. G. and TEUCHER, M. The primary spectrum of fast neutrons from a Ra–Be source and their inelastic collisions in Pb. II, 5805*
HOVE, L. VAN. *See* VAN HOVE, L.
HOVI, V. On the configurational contribution to the heat capacity of binary solid solutions, 5627. On Wasastjerna's theory of the heat of formation of solid solutions, 5634. On the configurational free energy of binary solid solutions of alkali halides, 5635. The configurational free energy of KCl–KBr mixed crystals at different temperatures, 5636. Entropy as a function of local order for binary solid solutions of alkali halides, 5637. On the ageing of KCl–KBR mixed crystals, 6568. X-ray studies on KCl–RbCl mixed crystals prepared from aqueous solution, 6581
HOVORKA, F. *See* YEAGER, E., 2476, 3144
HOWARD, A. Report of "Symposium on mode of action of ionising radiations," 4008
HOWARD, F. L. *See* BROIDA, H. P., 6927
HOWARD, J. N. *See* SHAW, J. H., 814, 5034
HOWARD, R. A. and BLEIL, C. E. Water movements induced by compaction of clastic sediments, 3962
HOWARTH, L. The boundary layer in three dimensional flow. I. Derivation of the equations for flow along a general curved surface, 3369. Some aspects of Rayleigh's problem for a compressible fluid, 9305
HOWELL, B., CHRISTENSEN, C. J. and MACLACHLAN, D., JR. A method for making accurately reproducible masks of the Huggins type, 9826
HOWELL, J. S. *See* BAKER, W. D., 3002
HOWELL, W. D. *See* MOODY, N. F., 7973, 9553–4
HOWEY, J. H. Analysis of an *R–C* oscillator, 4543
HOWLETT, J. *See* CASSELS, J. M., 7946, 9532
HOYAUX, M. The focusing principles of high energy particle accelerators. I, 5472. Theory of ionized media with translational symmetry, 9561–2
HOYLE, R. D. Temperature stresses in irregular solids, 3069
HOYT, G. D. and MCCORMICK, W. W. Study of the short duration, high intensity, electric arc as a source of visible light, 1789
HROSTOWSKI, H. J. and PIMENTEL, G. C. Interpretation of the infrared and Raman spectra of mixed crystals, 6857
HSI, E. *See* CURRY, B., 6088
HSIAO, C. C. and SAUER, J. A. On crazing of linear high polymers, 653
HSIAO, L. *See* DUFFIELD, R. B., 1278
HSU, E.-Y. *See* MCNOWN, J. S., 6773
HSU, K. N. *See* HU, T.-M., 1618
HSU, Y.-C. Relation of antiferromagnetic structure to the binding energies of some b.c.c. transition metals, 8869
HU, T.-M. and HSU, K.-N. Binding energy of the triton, 1618
HUANG, K. A note on Hildebrand's approximation for thermal pressures in solids, 2881. Phenomenological equations of motion for simple ionic lattices, 3503. Lattice vibrations and optical waves in ionic crystals, 6565. On the interaction between the radiation field and ionic crystals, 8346. *See also* VAN PATTER, D. M., 3712
HUANG, K. and RHYS, A. Theory of light absorption and non-radiative transitions in *F*-centres, 3196
HUANG, K. and WYLLIE, G. Behaviour of a molecule near a metal surface, 1409
HUANG, S.-S. On the Doppler broadening of absorption lines by turbulence and by multiple interstellar clouds, 2319. On turbulence in the atmospheres of the sun and the stars, 2336
HUAUX, A. On the concomitant displacements of the instantaneous axis of rotation and of the instantaneous principal axis of inertia of the earth, 6007. The concomitant displacements of the instantaneous axis of rotation, and inertia of the earth, 6008. *See also* MELCHIOR, P. L., 6008
HUBBARD, D., BLACK, M. H. and RYNDERS, G. F. Electrode function (*p*H response), hygroscopicity, and chemical durability of soda-lead oxide-silica glasses, 3142
HUBBARD, H. W. *See* SAGANE, R., 6476
HUBBARD, J. C. *See* FITZPATRICK, J. A., 1859
HUBBELL, H. H. *See* TURKEVICH, J., 1402, 3869
HUBER, A. Electric currents in a continuously variable medium, 9843
HUBER, O. *See also* FRAUENFELDER, H., 1272; WALTER, M., 2940
HUBER, O., HUMBEL, F., SCHNEIDER, H., DE SHALIT, A. and ZÜNTI, W. Decay of the mercury isomer Hg^{197}, 5698
HUBER, P. *See* BALDINGER, E., 1323; BICHSEL, H., 4733; HAEBERLI, W., 1140; MEYER, K. P., 1267; RICAMO, R., 1324; STEBLER, A., 619
HUBER, S. F. *See* BOENNING, C. B., 4191
HÜBER, W. Results and analysis of various modes of action and radiation on some biological systems, 4973
HUBERT, P. A study of the γ-rays emitted by Au^{198} using a spectrometer, 8175
HUBERT, P. and LABERRIGUE-FROLOW, J. On the γ-radiation of $^{82}_{36}Br$, 8939
HÜBNER, W. The application of quadripole theory to the Maxwell equations, 986. A photocell compensator of high sensitivity for measurements with thermal radiation detectors, 2490. *See also* LEO, W., 2489
HUBY, R. and NEWNS, H. C. Nuclear excitation by electric interaction with charged particles, 8218
HÜCKEL, E. *See also* BORN, K. F., 9277
HÜCKEL, E. and BINGEL, W. A quantum-mechanical one-dimensional model for special linear finite molecular chains (as possible model for forces between gene molecules in protoplasm), 5638
HÜCKEL, E. and KRAUSE, B. Relative stabilities of methylacenes and methlyenedihydroacenes, 5890
HUDDLESTON, C. M. *See* MEI, J. Y., 1288
HUDDLESTONE, R. H. *See* HENLEY, E. M., 8220
HUDIS, J. *See* TER-POGOSSIAN, M., 1997, 4643
HUDSON, A. M. *See* ALLRED, J. C., 8190
HUDSON, G. E. A theory of the dynamic plastic deformation of a thin diaphragm, 3099
HUDSON, R. P. Superconductivity in tin-germanium "alloys," 322. Investigation of superconductivity in lead compounds, 9490
HUDSPETH, E. L., SWANN, C. P. and HEYDENBURG, N. P. Deuteron bombardment of C^{14}, 2041

Hueter, T. F. Mechanical breakdown of quartz transducers at resonance, 9353. *See also* Ballantine, H. T., Jr, 2266
Hueter, T. F. and Bolt, R. H. An ultrasonic method for outlining the cerebral ventricles, 5208
Huetz, J. Contribution to the study of the oil layer, 6770
Huff, H. *See* Brady, A. P., 6170
Huggill, J. A. W. *See* Holland, F. A., 6168
Huggins, W. H. System-function analysis of speech sounds, 1699
Huggins, W. H. and Licklider, J. C. R. Place mechanisms of auditory frequency analysis, 5955
Hughes, A. F. W. Phase-contrast microscopy in biological research, 6655
Hughes, D. J. *See also* Burgy, M., 3054
Hughes, D. J. and Burgy, M. T. Reflection of neutrons from magnetized mirrors, 4763
Hughes, D. J., Burgy, M. T. and Woolf, W. E. Scattering and polarization of neutrons in an iron single crystal, 2069
Hughes, E. D., Ingold, C. K., Martin, R. J. L., Meigh, D. F. and Bunton, C. A. Walden inversion and reaction mechanism, 1391
Hughes, F. J. *See* Martin, D. S., Jr, 5689
Hughes, H. K. *See* Murphy, R. W., 2153
Hughes, J. The angular distribution of neutrons from the (d, n) reaction in light elements, 9697
Hughes, J. and Le Couteur, K. J. Spin orbit coupling in the nuclear shell model, 1240
Hughes, J. C. *See* Collett, C. T., 2402
Hughes, R. E. *See* Geller, S., 9168
Hughes, V. *See also* Grabner, L., 195, 6849
Hughes, V. and Grabner, L. Energy levels, selection rules, and line intensities for molecular beam electric resonance experiments with diatomic molecules, 643
Hugus, Z. Z. Jr and Latimer, W. M. The heat of oxidation of manganous ion to permanganate and the manganese potentials, 8281
Huibregtse, E. J., Barker, D. B. and Danielson, G. C. Electrical properties of sodium tungsten bronze, 9463
Huizenga, J. R. and Magnusson, L. B. Oxidation-reduction reactions of neptunium (iv) and -(v), 9046
Huizenga, J. R., Magnusson, L. B., Fields, P. R., Studier, M. H. and Duffield, R. B. Threshold for photoneutron reaction in U^{238}, 6462
Huizenga, J. R., Magnusson, L. B., Simpson, O. C. and Winslow, G. H. Neutron binding energies, 1277
Hulburt, E. O. Time of dark adaptation after stimulation by various brightnesses and colors, 6660
Hulburt, H. M. *See* Hollerman, E. M., 4173
Huldt, L. Determination of excitation energies of atoms with phototubes and oscillograph, 943
Hulet, E. K. *See* Reynolds, F. L., 2933
Hull, D. E. Measurement of Geiger counter plateau slope, 6279
Hull, M. H., Jr. *See* Bloch, I., 2391, 9687; Breit, G., 1560, 2392
Hull, R. A., Wilkinson, K. R. and Wilks, J. The specific heat of liquid helium at temperatures between 0·6° and 1·6°K, 5364
Hull, T. E. *See* Infeld, L., 5973
Hulm, J. K. The dielectric properties of some alkaline earth titanates at low temperatures, 295. The thermal conductivity of tin, mercury, indium and tantalum at liquid helium temperatures, 1794. The thermal conductivity of a copper-nickel alloy at low temperatures, 3479. *See also* Matthias, B. T., 5391
Hulm, J. K., Matthias, B. T. and Long, E. A. A ferromagnetic Curie point in $KTaO_3$ at very low temperatures, 294; Erratum, 1818
Hulthén, E. Refraction gratings, 1771
Hulthén, E. and Lind, E. Diffraction gratings and the plane mirror, 235
Hulthén, L. and Laurikainen, K. V. Approximate eigensolutions of $\frac{d^2\phi}{dx^2} + \left(a + \frac{b}{x}e^{-x}\right)\phi = 0$, 7448
Hultin, M. and Lagerqvist, A. An infra-red band-system of calcium oxide, 3437
Humbach, W. *See* Brix, P., 2513
Humbel, F. *See* Huber, O., 5698
Humblet, J. On the dispersion formula, 3778. Perturbation of virtual states ,7554
Hume, D. N. *See* Freedman, A. J., 1261
Hume, W., II. *See* Reynolds, S. E., 5940
Hume-Rothery, W., Irving, H. M. and Williams, R. J. P. The valencies of the transition elements in the metallic state, 9092
Hummel, H. H. and Inglis, D. R. Low states of Li^7 in intermediate coupling, 5658; Erratum, 8893
Hummel, V. *See also* Hamermesh, B., 8942
Hummel, V. and Hamermesh, B. Activation cross-sections measured with antimony-beryllium photo-neutrons, 4740
Humphrey, G. L. The heats of combustion and formation of titanium nitride (TiN) and titanium carbide (TiC), 7825
Humphreys, R. F. *See* Motz, H. T., 2040
Humphreys-Owen, S. P. F. *See* Fürth, R., 6152
Humphries, J. The earth's atmosphere, 3972
Hund, F. and Fricke, R. A new method for the determination of lattice perturbation due to thermal vibrations, 1212
Hund, F. and Müller, J. On a method of production at room temperature of precious metal alloys in powder form, 9888
Hung, C. S. Theory of resistivity and Hall effect at very low temperatures, 311
Hung, C. S. and Gliessman, J. R. The resistivity and Hall effect of germanium at low temperatures, 310
Hung, C. S. and Johnston, V. A. Resistivity of semiconductors containing both acceptors and donors, 308
Hunger, H. On the calculation of the intensity distribution in Fraunhofer lines. II. Calculation of the weight functions for a given Kirchoff–Planck function with an exponential term, 7473
Hu Ning. *See* Ning Hu.
Hunt, J. P. and Taube, H. The exchange of water between hydrated cations and solvent, 5849
Hunt, R. W. G. A method of keeping the luminance of a lamp constant without the use of an electric meter, 6095
Hunter, L. P. The inverse voltage characteristic of a point contact on *n*-type germanium, 3521. *See also* Bennett, A. I., 3522; Klahr, C. N., 5405
Huntington, H. B. Calculations of surface energy for a free-electron metal, 5628
Hurd, F. K. and Hershberger, W. D. Microwave spectrum of methyl mercaptan, 5279
Hürliman, T. *See* Jenney, L., 9892
Hurst, D. G. Chalk River N.R.X. nuclear reactor, 8213. *See also* Alcock, N.Z., 9007; Brockhouse, B. N., 8983–4; Goldschmidt, G. H., 7394
Hurst, D. G. and Alcock, N. Z. The scattering length of the deuteron, 1322, 3796
Hurst, D. G., Pressesky, A. J. and Tunnicliffe, P. R. The Chalk River single crystal neutron spectrometer, 646
Huruhata, M. Photoelectric study of the zodiacal light, 9238
Hurvich, L. M. *See also* Jameson, D., 7790
Hurvich, L. M. and Jameson, D. A psychophysical study of white. I. Neutral adaptation, 7789. The binocular fusion of yellow in relation to color theories, 9867
Hurwitz, H., Jr. *See also* Bethe, H. A., 1327
Hurwitz, H., Jr, and Bethe, H. A. Neutron capture cross sections and level density, 5782
Husimi, K. and Nishiyama, T. An algebraic theory of the density matrix I, 6035
Husimi, K. and Utiyama, R. Canonical theory of quantum electrodynamics, 5088
Husson, C. *See* Roux, E., 1472
Husson, R. Study of the fundamental physiological and acoustic phenomena of the singing voice. I, 3418. Physiological origin of the sensation of dissonance, and the reduction of musical aesthetics to the psycho-physiology of the auditory nerve and its relays, 6663
Huston, J. L. *See* Evans, A. E., 9048
Hutchinson, C. A., Jr and Pastor, R. Paramagnetic resonance absorption in potassium dissolved in liquid ammonia, 4530
Hutchinson, G. W. and Scarrott, G. G. A high precision pulse height analyser of moderately high speed, 7976

HUTCHINSON, W. C. A. and CHALMERS, J. A. The electric charges and masses of single raindrops, 3997
HUTCHISON, T. S. and REEKIE, J. The room temperature solubility of iron in copper, 9014
HUTTER, R. G. E. *See* GEORGE, D. E., 7001
HÜTTIG, G. F. Catalytic activity and composition of oxide systems, 1419
HUTTON, J. F. Spherulitic sectors, 1438
HUTTON, P. *See* HASTED, J. B., 8718
HUUS, T. Compound scattering of protons and deuterons, 7952
HUXLEY, H. E. and PERUTZ, M. F. New X-ray evidence on the configuration of polypeptide chains, 8362
HUYSKENS, P. *See* MUND, W., 2135
HUZIMURA, T. On the Barkhausen jumps in the course of magnetic after-effect, 1190. *See also* HIRONE, T., 8046
HVINDEN, T. Coincidence measurements, 4472
HYAMS, B. D., MYLROI, M. G., OWEN, B. G. and WILSON, J. G. A magnetic cosmic-ray spectrograph with counter recording, 439
HYDE, E. K. and O'KELLEY, G. D. Radiochemical and spectrometer studies of several neutron-deficient zirconium isotopes and their decay products, 7214
HYDE, G. E. *See* HORNIG, D. F., 177
HYLLERAAS, E. Two-electron angular wave functions, 4082. Note on the doubly excited state of the negative hydrogen ion, 8139
HYRNKIEWICZ, A. Z. On the angular distributions of electron pairs created in lead by gamma-rays of ThC'', 8179

IBAMOTO, H. *See* ITOH, J., 8844; KUMAGAI, H., 7097, 9600
IBERALL, A. S. Permeability of glass wool and other highly porous media, 3065
IBRAHIM, A. A. K. A correction factor to Gray's theory of ionization, 6287
ICHIKAWA, Y. *See* TSUYA, N., 9588
ICHIMURA, H. On the theory of the high polymer solution, 5161
ICHINOKAWA, T. *See* UEDA, R., 2613, 2762, 6201, 6585
ICHISHIMA, I. and MIZUSHIMA, S. On the lattice frequencies of 1,2-dihalogeno-ethanes, 1755. Lattice frequencies of benzene crystals, 3459. Entropy of crystalline benzene calculated from molecular data, 5375
IDA, K. Production of vector π-mesons by high energy nucleon-nucleon collisions, 8989
IGARASHI, J. The determination of sound absorption coefficient, 1709
IKAUNIEKS, J. Stars with reverse movement in a galaxy, 5998
IKEDA, N. *See* KIMURA, K., 9680
IKENBERRY, E. On the distribution function in phase space, with application to the statistical theory of liquids, 4148
ILFELD, R. M. Determination of moisture in gases by automatic dew point equipment, 9799
ILINA, A. A. *See* SHPOLSKIĬ, E. V., 6880
ILLINGWORTH, C. R. Unsteady laminar flow of gas near an infinite flat plate, 131
IMAEDA, K. *See* ARIZUMI, T., 1346
IMAI, I. Asymptotic solutions of ordinary linear differential equations of the second order, 2293. On the asymptotic behaviour of viscous fluid flow at a great distance from a cylindrical body, with special reference to Filon's paradox, 8545
IMANISHI, S. Color of diketo-pyrazolidine derivatives, 1463. Near-ultraviolet absorption spectrum of benzaldehyde vapor, 4286
IMBÓ, G. and CASERTANO, L. Statistical distribution of the α-particles registered on a photographic plate as function of the projection of their path on the plane of the plate, 3716
IMELIK, B. and CARTERET, Y. Study of the silica gel by the central scattering of X-rays, 1353
IMYANITOV, I. M. Method of measuring the conductivity of dielectrics, 1837
INFELD, L. The new Einstein theory and the equations of motion, 2360, 7502. *See also* EINSTEIN, A., 4047
INFELD, L. and HULL, T. E. The factorization method, 5973
INFELD, L. and SCHEIDEGGER, A. E. Radiation and gravitational equations of motion, 6722
INGÅRD, U. On the reflection of a spherical sound wave from an infinite plane, 5202
INGÅRD, U. and BOLT, R. H. Absorption characteristics of acoustic materials with perforated facings, 8596. A free field method of measuring the absorption coefficient of acoustic materials, 8597
INGELSTAM, E. A slit phase contrast apparatus with modified phase plates for the examination of optical gratings and other objects with variations in one dimension, 5323. *See also* CAMUS, A.-M., 5324
INGELSTAM, E. and DJURLE, E. A method of determining common stray light for ruled gratings and other spectral apparatus, 6899
INGELSTAM, E. and LINDBERG, P. J. A test procedure for simultaneous determination of resolving power and image surface of fluorographic cameras, 5296
INGHRAM, M. G., BROWN, H., PATTERSON, C. and HESS, D. C. The branching ratio of K^{40} radioactive decay, 3730
INGLADA GARCIA-SERRANO, V. Macroseismic methods of focal depth determination, 756
INGLIS, D. R. Heat flow in the earth (disc.), 3219. Spin-orbit coupling in Li^7 and Be^7, 4615. The $B^{10}(n, \alpha)$ reaction and the low excited state of Li^7, 5660. *See also* HUMMEL, H. H., 5658, 8893; KRONE, R. W., 2036; NEUENDORFER, J. A., 4708
INGOLD, C. K. *See* HUGHES, E. D., 1391
INGRAHAM, R. On a theory of "conformal relativity," 5067
INGRAHAM, R. L. Contributions to the Schrödinger non-symmetric affine unified field theory, 8498
INGRAM, D. J. E. *See* BLEANEY, B., 3638, 8036–7, 9605
INGRAM, M. and BARNES, S. W. Experimental confirmation of an unusual finding in the blood of cyclotron workers, 4009
INN, E. C. Y. Photolytic inactivation of ice-forming silver iodide nuclei, 7350. *See also* LA MER, V. K., 2139
INNES, K. K., CROSS, P. C. and GIGUÈRE, P. A. The asymmetric rotor. IX. The heavy water bands 2 787 cm^{-1} and 5 373 cm^{-1}, 9633
INOUE, E. Interaction between turbulons, 9302
INOUE, K. *See* MUTO, T., 5085
INOUE, N. *See* KUSHIDA, T., 9467
INSCH, G. M. and CURRAN, S. C. The beta spectrum of tritium, 8165
INSKEEP, R. G. *See* LANCASTER, J. E., 6128; MILLER, F. A., 2545
INUI, T. and UEMURA, Y. Theory of color centers in ionic crystals. II, 730
IOFFE, B., RUDIK, A. and SHMUSHKEVICH, I. Production of γ-quanta and neutral mesons in the capture of π^--mesons by deuterons, 6448
IOFFE, S. B., PROKOFEVA, I. A. and EIGENSON, M. S. A chromospheric telescope, 2306
IONOV, N. I. *See* DUKELSKII, V. M., 8806
IRSA, P. *See* TURKEVICH, J., 1405
IRVINE, J. W., JR. *See* MALETSKOS, C. J., 6443
IRVING, H. M. *See* HUME-ROTHERY, W., 9092
IRVING, J. Non-physical solutions in classical finite electron theory, 83. The binding energies of three- and four-particle nuclei, 5124
IRVING, J. H. and ZWANZIG, R. W. The statistical mechanical theory of transport processes. V. Quantum hydrodynamics, 9297
ISAACS, G. *See* CHASMAR, R. P., 6910
ISAACS, J. D. and WIEGEL, R. L. The thermopile wave meter, 3229
ISAACS, J. D., WILLIAMS, E. A. and ECKART, C. Total reflection of surface waves by deep water, 5151
ISAACS, P. *See* CHEDESTER, C., 7288
ISAACSON, E. *See* EVANS, G. W., II, 5346
ISENBERG, I. The virial theorem and the variation principle, 91, 2394. The ionization of hydrogen in metals, 401. Overlap forces and elastic constants of body-centered cubic metals, 8084
ISFORD, G. *See* PRINGLE, R. W., 8940
ISHIDZU, T. Effects of nuclear motion on the fine and the hyperfine structure of hydrogen, 3706; I, 7189; II, 8138*
ISHIDZU, T. and OBI, S. On the energy levels of the configurations d^4p, d^5p and d^6p, 549. Structure of the f^n electron configurations. I. Coefficients of fractional parentage of f^3, 550; II. Spin-orbit interaction of the configuration of f^3, 551

Ishiguro, E., Kambe, K. and Usui, T. The spin relaxation of chromium alum, 5580. Exchange interaction of nickel ions in nickel fluosilicate crystal, 7093

Ishiguro, K. Application of the double slit interferometer to the measurement of phase shift of light transmitted through thin films, 228. An experiment on 16 times amplification of the phase-shift of thin films, 1768. The phase-shift measurement of thin films and its amplification, 2580. Numerical tables for the phase and intensity measurements of metallic film. I, 5314; II, 5315

Ishiguro, K. and Kuwahara, G. Determination of the optical constants of Ag films from the measurements of intensity and phase change. I, 5316; II, 5317

Ishikawa, K. *See* Hibi, T., 7985, 8807

Isihara, A. Probable distribution of segments of a polymer around the center of gravity, 721. Transport phenomena in degenerate systems. I. General theory in a mixed system, 1663; II. Degenerate Bose–Einstein gas, 1664. Determination of molecular shape by osmotic measurement, 2903. Theory of high polymer solutions (the dumbbell model), 4157. Theory of anisotropic colloidal solutions, 9081

Isihara, A. and Hayashida, T. Theory of high polymer solutions. I. General form of second osmotic coefficient, 6067; II. Special forms of second osmotic coefficient, 6068

Isikawa, K. *See* Hibi, T., 4163

Ismaïlov, S. V. and Furman, A. M. On the extraction of electrons from metals by neutral gas molecules with electro-negative properties, 7017

Isobe, K. *See* Ebe, M., 5951

Israël, H. On diurnal variation of the atmospheric electric potential gradients, 2227

Israël, H. and Sommermeyer, K. On the partial reflection of electromagnetic waves in the troposphere, 8063

Israel, H. I. and Wilkinson, R. G. The radiation of Tl^{199} and Tl^{200}, 9656

Ito, R. Pressure dependence of sensitivity of photoelectron counters, 8793

Ito, T. *See also* Mizushima, M., 6377

Ito, T. and Mori, H. The crystal structure of ludlamite, 9157

Ito, T., Morimoto, N. and Sadanaga, R. The crystal structure of boracite, 9147

Ito, T. and Sadanaga, R. A Fourier analysis of the structure of tourmaline, 9159

Ito, T. and Sawada, H. An electron-diffraction study of chalcopyrite film grown upon enargite, 1487

Itoh, J. *See also* Fujimoto, M., 7092; Kanda, T., 9643

Itoh, J. and Akioka, T. Ferromagnetic resonance absorption by Mo-permalloy at 3 000 Mc/sec, 2832

Itoh, J., Fujimoto, M. and Ibamoto, H. Paramagnetic resonance absorption in three chlorides of copper, 8844

Itoh, J. and Kobayashi, D. Harmonic resonance accelerator-microtron, 6255

Itterbeek, A. van. *See* van Itterbeek, A.

Ittner, W. B., III. *See also* Ter-Pogossian, M., 8799

Ittner, W. B., III and Ter-Pogossian, M. Scintillation detector for the localization of radioactive concentrations *in vivo*, 8800

Ivanenko, D. and Rodichev, V. Statistical model of nuclear shells, 3694

Ivanenko, D. and Sokolov, A. Theory of nuclear shells, 2909

Ivanenko, D. D. and Brodskiĭ, A. M. Gravitational radiation friction, 3350

Ivanoff, A. On the geometric aberration of the eye, 1551. A window for under-water photography, 5961

Ivanov, K. I. Variation of the coefficient of the absorption of light as dependent upon the variation of the diameters of particles suspended in water, 2584

Ivanova, N. I. *See* Zelikin, Ya. M., 3448

Ivashenko, N. V. Propagation of transverse waves along eddy filaments, 8549

Iveronova, V. I. *See* Beznosikova, A. V., 3210

Iverson, H. W. and Balent, R. A correlating modulus for fluid resistance in accelerated motion, 3372

Ives, D. J. G. *See* Hills, G. J., 4841–3

Ives, H. E. The clock paradox in relativity theory, 9262

Ivey, D. G. *See* Dauphinee, T. M., 2598

Ivin, K. J. and Steacie, E. W. R. The disproportionation and combination of ethyl radicals: the photolysis of mercury diethyl, 8301

Ivlev, V. F. *See* Kirenskiĭ, L. V., 3642; Tsomakion, B. F., 4537

Iwaki, R. *See* Yamamoto, D., 5893

Iwase, Y. Electric conductive and dielectric studies on animal tissue with special reference to blood and red cells, 4976

Iwata, G. Gauge-spin transformations and wave equations, 5107. Non-hermitian operators and eigenfunction expansions, 8421

Iwata, T. *See* Yamamoto, M., 4536

Iyengar, K. S. Temperature dependence of ultrasonic velocity in alcohols, 5179

Jabłónski, A. Fundamental polarization of photoluminescence and torsional vibrations of molecules, 7764

Jaccarino, V. and King, J. G. On the ratio of the nuclear magnetic and electric quadrupole interactions for atomic Cl^{35} and Cl^{37}, 8128

Jack, H. R. S. *See* Leah, J., 1760

Jack, K. H. The iron-nitrogen systems: the preparation and the crystal structures of nitrogen-austenite (γ) and nitrogen-martensite (α'), 8407. The occurrence and the crystal structure of α''-iron nitride; a new type of interstitial alloy formed during the tempering of nitrogen-martensite, 8408. *See also* Gutmann, V., 6583

Jack, K. H. and Gutmann, V. The crystal structure of vanadium trifluoride, VF_3, 6584

Jackson, J. Spectrograph for the Radcliffe Observatory, Pretoria, 2308

Jackson, J. D. Nuclear two-body interactions, 9270

Jackson, J. L. A variational approach to nuclear reactions, 6751

Jackson, L. C. *See also* Burge, E. J., 2629

Jackson, L. C. and Henshaw, D. G. The velocity of flow of helium II in the creeping film, 1018

Jackson, L. C. and Preston-Thomas, H. Superconductivity of niobium, 2702. A small gas-cooled cryostat for temperatures between 4°K and 14°K, 5362

Jackson, W. "Sudden commencements" in geomagnetism, 1528. Information theory (conf. rep.), 2482

Jacob, H. *See* Falkenhagen, H., 5399

Jacob, L. Some crossover properties in the electron immersion objective, 368

Jacobs, H. and Dobischek, D. Interaction of slow electrons and surface films of ionic crystals, 5465

Jacobs, J. *See* Coulson, C. A., 5639–40

Jacobs, R. B. The design of molecular pumps, 2441

Jacobsen, L. S. *See* Ayre, R. S., 900

Jacobson, H. The informational capacity of the human eye, 5947. Information and the human ear, 7432

Jacobson, H., Beckmann, C. O. and Stockmayer, W. H. Intramolecular reaction in polycondensations. II. Ring-chain equilibrium in polydecamethylene adipate, 3177

Jacobson, H. and Stockmayer, W. H. Intramolecular reaction in polycondensations. I. The theory of linear systems, 3176

Jacobson, L. O., Simmons, E. L., Marks, E. K. and Eldredge, J. H. Recovery from radiation injury, 7433

Jacq, J. Contribution to the graphical study of thermally variable systems, 5345, 7799

Jacquesson, J. and Lataste, A. Determination of the energy *hν* of a γ-ray by absorption of photoelectric electrons, 7248

Jacquesson, R. Linked X-ray tubes for the research laboratory, 2724

Jacquet, P. A. Electrolytic polishing and oxidation of titanium and examination of micrographic structure by these methods, 3075

Jacquinot, P. *See* Broachard, J., 8247; Dossier, P., 5326, 7783

Jaeger, J. C. Conduction of heat in a solid with a power law of heat transfer at its surface, 250

Jaeger, J. C. and Harper, A. F. A. Nature of the surface of the moon, 1579

Jaeger, J. C. and Westfold, K. C. Equivalent path and absorption for electromagnetic radiation in the solar corona, 2327

Jaffe, J. H. The measurement of refractive indexes of liquids in the infrared, 5237

Jaffey, A. H. *See also* Fried, S., 4639

Jaffey, A. H., Lerner, J. and Warshaw, S. Radiations from UY, 5706

Jaffray, J. *See also* Bresson, R., 6921

Jaffray, J. and Cariat, J. Some physical properties of nickel amalgams, 2612

Jaffray, J. and Lyand, R. On the specific heat of vanadium sesquioxide between 70 and 300°c, 8705

Jager, C. de. *See* de Jager, C.

Jäger, F. W. *See* ten Bruggencate, P., 30

Jahn, H. A. Theoretical studies in nuclear structure. II. Nuclear d^2, d^3 and d^4 configurations. Fractional parentage coefficients and central force matrix elements, 2919. *See also* Elliott, J. P., 2918

Jakob, M. *See* Wilson, L. H., 7604

Jakobson, M., Schulz, A. and Steinberger, J. Detection of positive π-mesons by π^+ decay, 4752

James, H. M. and Lehman, G. W. Semi-conducting materials. Fermi levels in bombarded semi-conductors, 7860

James, J. A. Orientation of crystals using a Geiger counter X-ray spectrometer, 2164

James, J. A., Milner, C. J. and Watts, B. N. The structure of lead sulfide films, 2084

James, J. C. The conductivity of aqueous solutions of a 6 : 1 valency type electrolyte, 9059

James, J. C. and Monk, C. B. The conductivities of potassium and lanthanum cobalticyanides and ferricyanides, 3858

James, T. H. *See* Fortmiller, L., 1554

Jameson, D. *See also* Hurvich, L. M., 7789, 9867

Jameson, D. and Hurvich, L. M. A psychophysical study of white. II. Neutral adaptation. Area and duration as variants, 7790

Jamgochian, E. *See* Lehovec, K., 8654

Jancel, R. The second principle of thermodynamics and wave mechanics, 6755

Jander, J. *See* Thilo, E., 1475

Janik, J. A. On the selective absorption of thermal neutrons in selenium and arsenium, 8203

Janossy, J. *See* Heitler, W., 473

Jánossy, L. On the absorption of a nuclear cascade, 3792. Search for periodicities, 6678

Jánossy, L. and McCusker, C. B. A. The nature of the penetrating particles in air showers, 425

Jánossy, L. and Messel, H. Fluctuations of the electron-photon cascade—moments of the distribution, 435. Cascade theory including ionization loss, 2794

Jansen, L. *See* de Groot, S. R., 1809, 6179

Jansen, M. T. *See* Rottier, P. B., 8588

Janssens, P. The range in minerals of tritons from the reaction Li^6(n, α) H^3 (2·7 MeV), 5781

Janssens, P. and Gribaumont, A. On neutron distribution in a moderator, 3050

Janssens, P. and Prigogine, I. A generalization of the method of Lennard–Jones and Devonshire for the calculation of the configurational integral. I, 3345

Janz, G. J. *See* Axford, D. W. E., 6859

Jaoul, B. On the transverse stresses which develop in tensile tests, 4801. *See also* Crussard, C., 665, 7439

Japolsky, N. S. Electromagnetic theory of gravitation, 7507

Jaquinot, P. Studies on weak lines in optical spectra, 2506

Jarmie, W. N. *See* Mather, J. W., 7295; Terwilliger, K. M., 7267

Jarvis, C. J. D. and Ross, M. A. S. Modes of disintegration of ionium: an investigation using β-sensitive emulsions, 6419

Jarvis, G. A., Hemmendinger, A., Argo, H. V. and Taschek, R. F. Reaction constants for T^3(p, n)He^3, 608

Jasinski, W. *See* Prowse, W. A., 9508

Jason, A. C. *See* Barton, J. C., 2815; George, E. P., 458

Jastrow, R. On the nucleon-nucleon interaction, 3331. On the hard sphere model of the nucleon, 4454. An interpretation of nuclear cross sections for high energy neutrons, 5784

Jaswon, M. A. *See also* Foreman, A. J., 3091; Henry, W. G., 3678

Jaswon, M. A., Henry, W. G. and Raynor, G. V. The cohesion of alloys. I. Intermetallic systems formed by copper, silver, and gold, and deviations from Vegard's law, 3677

Jauho, P. On the unique determination of the nuclear potential between charged nucleons with the aid of scattering experiments, 6038

Jaumot, F. E., Jr. *See* Nix, F. C., 1341, 4774

Jauneau, L. *See* Bousser, F., 3610

Javan, A. *See* Miller, S. L., 5282

Jayaraman, A. *See* Raman, C. V., 733, 969, 1474

Jaynes, E. T. Displacement of oxygen in BaTiO$_3$, 1042

Jean, M. The methods of second quantization and of configuration space in the relativistic theory of systems of particles. I. Fermions without interaction; II. Spin-zero bosons without interaction, 5086; III. Derivation of relativistic equations for interacting particles, 7519

Jean, M. and Prentki, J. On the scattering of π-mesons by nucleons, 1617

Jech, Č. Double development of nuclear emulsions, 2281. *See also* Běhounek, F., 2140

Jefferies, C. D. *See* Block, F., 1982

Jeffrey, G. A. A refinement of the crystal structure analysis of β-isoprene sulphone, 2189. *See also* Cox, E. G., 1761

Jeffreys, H. Heat flow in the earth (disc.), 3219. Potassium and the earth's thermal state, 3219. Dynamic effects of a liquid core. II, 5933. The surface elevation in cellular convection, 9417

Jeffreys, H. and Bland, M. E. M. The instability of a fluid sphere heated within, 9839

Jeffries, C. D. A direct determination of the magnetic moment of the protons in units of the nuclear magnetron, 5662

Jehle, H. Quantum-mechanical resonance between identical molecules, 720; Errata, 3169

Jelatis, J. G. Measurements of dielectric constant and dipole moment of gases by the beat frequency method, 9442

Jelley, J. V. The radioactivity of F^{20}. I, 2005. Detection of μ-mesons and other fast charged particles, in cosmic radiation, by the Cerenkov effect in distilled water, 3047. Beta and gamma radiation. I–III, 8166

Jen, C. K. Rotational magnetic moments in polyatomic molecules, 3686. Molecular and nuclear magnetic moments in microwave Zeeman spectra, 7155. *See also* Eshbach, J. R., 2923

Jenckel, E. and Gorke, K. Disintegration of solutions of polymethacrylic esters, 3174

Jenkins, C. H. M. *See* Clayton, D., 3841

Jenkins, H. G. and McKeag, A. H. Some rare earth activated phosphors, 1751

Jenkins, R. *See* Bierman, H. R., 4133

Jenkins, R. O. The development of end-window Geiger–Müller counter tubes, 4466

Jenkins, W. D. Creep of high-purity aluminum, 5838

Jenkins, W. D. and Digges, T. G. Creep of high-purity copper, 2110

Jenkner, K. *See* Broda, E., 6401

Jenks, G. H., Sweeton, F. H. and Ghormley, J. A. A precise determination of the half-life and average energy of tritium decay, 2946

Jenney, L. and Hürlimann, T. On the shrinkage factor of photographic plates, 9892

Jennings, B. *See also* Allen, A. J., 4698; Sun, K. H., 5741, 5755

Jennings, B., Sun, K. H. and Leiter, H. A. Neutron production by proton bombardment below the (p, n) threshold, 2038

Jennings, L. *See* Kip, A. F., 9599

Jensen, E. N. *See also* Martin, D. S., Jr, 5689

Jensen, E. N., Laslett, L. J. and Zaffarano, D. J. The disintegration of praseodymium 142, 2943

Jensen, E. N., Nichols, R. T. and Clement, J. Beta-spectrum of As^{77}, 3736

Jensen, H. Anallactic telescope systems, 248. *See also* Beyerle, K., 5678

Jensen, J. H. D. *See* Haxel, O., 538; Steinwedel, H., 1231, 1235

Jensen, P. *See* Steinwedel, H., 1235

Jensen, P. G. *See* Ward, A. H., 6665

Jentschke, W. K. *See also* Taylor, C. J., 6893

Jentschke, W. K., Eby, F. S., Taylor, C. J., Remley, M. E. and Kruger, P. G. The fluorescence efficiencies of some crystals, for electrons and heavy particles, 6894

Jepsen, R. L. and Muller, M. W. Enhanced emission from magnetron cathodes, 9566

Jerome, C. W. *See* Butler, K. H., 217

Jerrard, H. G. Turbulence in apparatus for measurement of streaming double refraction, 112. Use of a half-shadow plate with uniform field compensators, 2592. *See also* Braybon, J. E. H., 8659

Jerslev, B. Crystal structure of *syn p*-chlorobenzaldoxime, 1517

Jessel, M. On diffracting openings in electric guides, 6364

Jessup, R. S. *See* Roberts, D. E., 3882

Jielof, H. *See* de Vries, H., 2242

Jobling, A. and Lawrence, A. S. C. Viscosities of liquids at constant volume, 5142

Joel, N. and Canepa, F. G. On the crystal structure of thyroxine, 6599

Johansson, C. H. Photographic recording of ultra-high speed phenomena, 4024

Johansson, S. Beta-decay of Ag^{111} and spin-orbit coupling in Cd^{111}, 585

Johansson, S., Cauchois, Y. and Siegbahn, K. The disintegration of As^{74}, 5701

Johansson, S. A. E. A scintillation spectrometer for high-energy gamma-rays, 1291

John, G. *See* Emmerich, W. S., 7246

Johns, H. E. The betatron in cancer therapy, 2263. *See also* Darby, E. K., 5686; Haslam, R. N. H., 5769; Katz, L., 5770

Johns, H. E., Cunningham, J. R. and Katz, L. Range of high energy electrons in aluminium, 8776

Johns, H. E., Darby, E. K. and Kornelsen, R. O. Radiotherapeutic physics. I. The physical aspects of treatment of cancer by 22 MeV X-rays, 9880

Johns, H. E., Katz, L., Douglas, R. A. and Haslam, R. N. H. Gamma-neutron cross-sections, 3021

Johns, M. W. *See* Petch, H. E., 1969

Johnson, C. B. *See* Wagener, S., 8576

Johnson, C. F. A synchronized high voltage pulse generator, 7974

Johnson, C. H. *See also* Petree, B., 8986

Johnson, C. H. and Barschall, H. H. Interaction of fast neutrons with nitrogen, 3028

Johnson, C. H., Bockelman, C. K. and Barschall, H. H. Disintegration of neon by fast neutrons, 6465

Johnson, C. I. and Taylor, H. A. The effect of temperature on the photolysis of methylamine, 5870

Johnson, C. M. *See* Anderson, R. S., 9384

Johnson, D. L. *See* Yates, J. G., 861, 4127

Johnson, D. S. *See* Fowler, F. E., 5980

Johnson, E. O. and Malter, L. A floating double probe method for measurements in gas discharges, 1078

Johnson, E. R. Decomposition of hydrogen peroxide by high energy X-rays, 9772

Johnson, E. W. and Nash, L. K. A magnetically compensated vapour density balance, 4131

Johnson, F. B. *See* Ross, I. M., 4612

Johnson, F. T. *See* Bearden, J. A., 2357

Johnson, G. W. Some observations on the epitaxy of sodium chloride on silver, 744. The epitaxy of alkali chlorides on metals, 6563. *See also* Scharff-Goldhaber, G., 8919

Johnson, J. B. The origin of bombardment-enhanced thermionic emission, 7046

Johnson, M. Alternative time-dependences of cosmological quantities or scales, 4041

Johnson, M. F. *See* Ferry, J. D., 6055

Johnson, M. H. Ionic mobilities and the electric quadrupole moment of N$_2$, 1144. Inelastic scattering of π-mesons, 8221

Johnson, N. K. Vertical distribution of atmospheric humidity near the ground, 2212

Johnson, P. C. *See* Werner, G. K., 8621

Johnson, P. D. and Studer, F. J. Absorption spectrum of thallium-activated potassium chloride phosphor at low temperatures, 6854

Johnson, P. D. and Williams, F. E. The interpretation of the dependence of luminescent efficiency on activator concentration, 2555. Luminescent efficiency of organic solutions and crystals, 3451

Johnson, P. R. and Bosworth, R. C. L. A new method of measurement of the surface tension of viscous liquids, 6059

Johnson, R. A., McClure, B. T. and Holt, R. B. Electron removal in helium afterglows, 1865

Johnson, S. J. *See* Rogers, T. F., 911

Johnson, V. *See* Sturm, W. J., 8186

Johnson, V. A. *See also* Hung, C. S., 308

Johnson, V. A. and Fan, H. Y. Temperature dependence of the energy gap in germanium from conductivity and Hall data, 312

Johnson, V. A. and Lark-Horovitz, K. Semi-conducting materials. Effect of bombardment upon a classical semi-conductor in thermal equilibrium, 7860. The combination of resistivities in semi-conductors, 7875

Johnson, V. R. *See* Richards, H. T., 8790

Johnston, H. L. *See also* Edwards, J. W., 3487, 4908, 8358; Friedman, A. S., 4333; Fritz, J. J., 2706; Holden, R. B., 1730; Kerr, E. C., 3485; Koch, G. P., 4233; Rubin, T., 8699; Skinner, G. B., 3488; Smith, A. L., 198, 4263; Taylor, W. J., 4297; White, D., 256

Johnston, H. L. and White, D. Pressure-volume-temperature relationships of gaseous normal hydrogen from its boiling point to room temperature and from 0–200 atmospheres, 126

Johnston, H. S. Interpretation of the data on the thermal decomposition of nitrous oxide, 6522

Johnston, H. S. and Crosby, H. J. Rapid gas phase reaction between nitric oxide and ozone, 7340

Johnston, R. J. and Ubbelohde, A. R. A wedge effect at amalgam/electrolyte surfaces, 5154

Johnston, W. M. *See* Grosse, A. V., 6396

Joliet, J.-F. Statistical radius of methylenic chains, 1224

Jollivet, L. Relation between atom vibrations of metals in solid state and their heats of fusion, 5632

Jolly, J. D. and Champion, F. C. The angular distribution of protons emitted in some F(α, p)Ne resonance reaction, 2992

Jona, F. Elasticity of piezo- and ferro-electric crystals, 3089

Jones, A. V. Infra-red and ultraviolet spectra of sulphur monoxide, 201. *See also* Herzberg, G., 4274; Sutherland, G. B. B. M., 7727

Jones, B. and Worsfold, D. J. Determination of reaction-rates by conductivity measurements, 7341

Jones, D. A. *See* Paul, W., 6858

Jones, D. C. Some comments on the B.E.T. (Brunauer–Emmett–Teller) adsorption equation, 3874. The adsorption isotherm of Langmuir and of Brunauer, Emmett, and Teller for multilayers where $n = 3$, 8310. *See also* Ottewill, R. H., 1455

Jones, D. C. and Birks, E. W. The adsorption isotherm of Langmuir and of Brunauer, Emmett, and Teller for multilayers where n is 2, 5878

Jones, D. M., Martin, P. M. E. and Thornhill, C. K. A note on the pseudo-stationary flow behind a strong shock diffracted or reflected at a corner, 9346

Jones, D. R. *See* Sard, R. D., 8012

Jones, D. S. Note on diffraction by an edge, 3654

Jones, E. A. *See also* Lagemann, R. T., 5286; Nielsen, A. H., 8645

Jones, E. A. and Burke, T. G. The infra-red and Raman spectra of COClF, 963

Jones, E. A., Kirby-Smith, J. S., Woltz, P. J. H. and Nielsen, A. H. New measurements on the infrared spectrum of F$_2$O, 4251. The infrared and Raman spectra of SiF$_4$, 4283

Jones, E. A. and Woltz, P. J. H. The infra-red spectrum of nitrosyl fluoride, 2536

Jones, E. J. *See* Gorman, J. G., 4885; Goward, F. K., 3026

Jones, F. E., Hooper, J. E. N. and Alder, N. L. The radar-sonde system for the measurement of upper wind and air data, 2196, 9192

Jones, F. Llewellyn and Davies, D. E. Influence of cathode surface layers on minimum sparking potential of air and hydrogen, 6235. Mechanism of secondary ionization in low pressure breakdown in hydrogen, 6241

Jones, F. Llewellyn and de la Perrelle, E. T. Cold emission of electrons in spark gaps, 8749

Jones, F. Llewellyn, de la Perrelle, E. T. and Morgan, C.-G. The role of the electrodes in the mechanism of initiation of spark discharges in gases, 4425

Jones, F. Llewellyn and Morgan, C. G. Failure at Paschen's law and spark mechanism at high pressure, 6997

Jones, F. Llewellyn and Morgan, G. D. High-frequency discharges. I. Breakdown mechanism and similarity relationship, 7920; II. Similarity relationship for minimum maintenance potentials, 7921

Jones, G. A. and Wilkinson, D. H. The reaction $C^{13}(\alpha n)O^{16}$, 9686

Jones, G. O. A thermal switch for use at low temperatures, 6174. An oil-free gas-tight compressor, 9432. *See also* Holland, F. A., 6168

Jones, H. A discussion on detonation: theoretical considerations relating to the detonation of solid explosives, 3120. The Hall coefficient of semi-conductors, 3527

Jones, H. Spencer. *See* Spencer Jones, H.

Jones, L. A. and Higgins, G. C. Photographic granularity and graininess. V. Variable-magnification instrument for measuring graininess, 4984; VI. Performance characteristics of the variable-magnification graininess instrument, 4985; VII. A microphotometer for the measurement of granularity, 5231

Jones, L. H. and Badger, R. M. The infra-red spectrum and molecular structure of HNCS, 2906

Jones, L. W. *See also* Terwilliger, K. M., 7267

Jones, M. E. and Schomaker, V. The use of punched cards in molecular structure determinations. IV. Approximations to the temperature factor, 4905

Jones, R. and Bell, E. E. The $2 \cdot 7\mu$ bands of carbon dioxide, 959

Jones, R. V. Parallel and rectilinear spring movements, 2400. Radiation pressure in a refracting medium, 6092. Some points in the design of optical levers and amplifiers, 6158. *See also* Paul, W., 6858

Jones, S. B. and White, R. S. Relative energy and angle distribution of low energy π^- mesons from 390-MeV alpha-particles on carbon. μ^- meson endings, 5742

Jones, W. M. The relative rates of reaction of hydrogen and tritium hydride with chlorine, 4834. The half-life of tritium by absolute counting, 8160. Mobility in a sorbed layer. I. The flow of gases and vapours through porous media, 8569

Jongen, H. F. Sudden increase of cosmic ray intensity following large meteoric activity, 8006. *See also* Clay, J., 417, 460

Jonker, G. H. *See* van Santen, J. H., 309, 6335

Jonsson, C. V. Studies on five-dimensional relativity theory, 5062

Joos, M. Description of language design, 1692

Jope, E. M. *See* Beaven, G. H., 9379

Jope, M. *See* Perutz, M. F., 7733*

Jordan, D. O. and Mathieson, A. R. Kinetics of the polarization of styrene by Friedel–Crafts catalysts, 4823

Jordan, P. *See also* Govaerts, J., 626; Heckmann, O., 4076

Jordan, P., Scherrer, P. and Zünti, W. On the radio-activity of chromium of mass 55, 6414

Joshi, S. S. and Tuli, G. D. Refrachor: a new physical constant, 5894

Josien, M.-L. and Fuson, N. A new infrared band characteristic of amino-acid hydrochlorides, 7740

Josso, E. Relation between structure and magnetic properties of iron-nickel alloys close to $FeNi_3$, 7074

Jost, R., Luttinger, J. M. and Slotnick, M. Distribution of recoil nucleus in pair production by photons, 1295

Jost, R. and Pais, A. On the scattering of a particle by a static potential, 6747

Jost, W. and Sieg, L. Observations on anomalous burner flames, 9425

Joussot-Dubien, J. *See* Pacault, A., 8017

Jowitt, S. Levelling by radar altimeter, 822

Judd, D. B., Plaza, L., and Farnsworth, D. Tritanopia with abnormally heavy ocular pigmentation, 3243

Judson, C. M., Argyle, A. A., Dixon, J. K. and Salley, D. J. Radiotracer study of cationic surface-active agents by measurement of gegenion adsorption, 5883

Judson, C. M., Argyle, A. A., Salley, D. J. and Dixon, J. K. Use of radiotracers to measure surface adsorption from mixtures, 1453

Julian, D. B. and Ruby, W. R. The use of the stationary platinum microelectrode in the determination of half-wave potentials, 1466

Jung, K. The temperature-gradient at the Earth's surface and the radioactive heat-production in the Earth's crust taking into account the half-lives, 2192

Jungerman, J. Fission excitation functions for charged particles, 602. Energy barrier for asymmetric fission in the static liquid drop model, 2058

Jura, G. *See also* Pimentel, G. C., 5273

Jura, G. and Criddle, D. Phase transitions of argon adsorbed on graphite, 6540

Jura, G. and Powell, R. E. Kinetics of gas adsorption as a method of area determination, 4861

Justi, E. *See also* Gehloff, P. O., 330

Justi, E. and Kohler, M. Hall effect and electron configuration in the noble metals, 9623

Justi, E., Kohler, M. and Lautz, G. Path-length problems of electrons in metals and semiconductors, 9460. The thermoelectric power of metal films, 9498

Juza, R. and Puff, H. The crystal structure of Co_2C, 9831

Kaan, J. F. and Westerdijk, J. B. An optical method for following mixing processes, 7660

Kaempf, F. Herschel effect and sensitization with the help of prior illumination, 4986

Kaenzig, W. Atomic positions and vibrations in the ferro-electric $BaTiO_3$ lattice, 1506

Kaesberg, P. *See* Leonard, B. R., Jr, 7426; Ritland, H. N., 1227

Kagan, Yu. M., Fedorov, V. L., Malyshev, G. M. and Gavallas, L. A. On a technique for measuring the electronic velocity-distribution function in a gas-discharge, 3540

Kagarise, R. E. *See* Saksena, B. D., 7699, 7715–16

Kageyama, S. *See* Miwa, M., 3733

Kahan, T. *See also* Eckart, G., 1948, 7128

Kahan, T. and Eckart, G. Theory of the propagation of electromagnetic waves in an atmospheric wave-guide, 2865

Kahle, H. G. *See* Hellwege, K. H., 4254–5

Kahler, H. *See* Eden, M., 1357

Kahn, D. *See* Groetzinger, G., 1286

Kahn, F. D. On the expulsion of corpuscular streams by solar flares, 5030. An investigation into the possibility of observing streams of corpuscles emitted by solar flares. II, 5031

Kahn, M. Enrichment of antimony activity through the Szilard–Chalmers separation, 3757. *See also* Bonner, N. A., 8954–5

Kainuma, Y. Structure of thin metallic films formed by evaporation on molybdenite, 9016

Kaiser, H. On the physics and technology of spectrochemical light sources, 4326

Kaiser, T. R. On the radio-frequency requirements of high energy electron synchrotrons, 7004

Kakiuchi, Y., Komatsu, H. and Kyoya, S. Spectroscopic evidence for the proton conductivity through solid alcohols, 4375

Kakiuchi, Y., Sakurai, T. and Suzuki, T. Anomalous specific heat and molecular rotation in normal solid alcohols, 2642

Kakiuchi, Y., Shono, H., Komatsu, H. and Kigoshi, K. Proton magnetic resonance absorption in hydrogen perchlorate monohydrate and the structure of oxonium ion, 8843

Kakushadze, T. I. *See* Akulov, N. S., 8907

Kalashnikov, A. G. New types of microvariations of the geomagnetic field, 9183

Kalashnikov, S. G. and Erastov, L. N. Formation of barrier layers in alloys by means of chemical compounds, 5404

Kalb, G. and Wittborg, W. The symmetry of carborundum crystals on the basis of vicinal phenomena, 7372

Kale, R. S. Studies in infra-red radiation of the atmosphere. I. An instrument for the measurement of infra-red radiation during day and night, 9194

Kalinichenko, I. I., Pekerman, F. M. and Trofimov, A. K. Phosphors for erythema lamps, 8647

Källén, G. Formal integration of the equations of quantum theory in the Heisenberg representation, 2363
Kallmann, H. *See also* Broser, I., 209; Furst, M., 6892
Kallmann, H. and Furst, M. Fluorescence of solutions bombarded with high energy radiation (Energy transport in liquids). I, 224; II, 4301. Data on fluorescent liquids for scintillation counters, 6280. Energy storage and light stimulated phosphorescence in activated NaCl crystals induced by gamma-rays, 7775
Kallman, H. and Päsler, M. Calculations of the matrix elements of the H atom by means of the Laplace transformation, 857
Kalt, W. B. *See* Saidel, L. J., 7689
Kalusche, H. A loudspeaker arrangement with unilateral directivity, 2473
Kamaliddin, A. R. *See* Bawn, C. E. H., 4871–2
Kamat, L. S. *See* Prasad, M., 6327
Kamata, K. *See* Nishimura, J., 5523, 8774
Kambe, K. *See* Ishiguro, E., 5580, 7093
Kameda, T. and Miura, I. On the second maximum of the Rossi transition curve, 9570
Kamefuchi, S. Note on the direct interaction between spinor fields, 8510
Kamel, R. *See* Yousef, Y. L., 6804
Kamenetskaya, D. S. *See* Danilov, V. I., 3058
Kamenetskiĭ, Yu. *See* Abdullaev, A., 5547
Kamieński, B. Preparation and testing of the electrometric adsorption element (Potentiometric chromatography). III, 2150. Electrometric selective adsorption. The antimony electrode. IV, 2151
Kamiyoshi, K. A new deduction formula for measuring the dielectric constant of powder dielectric. I, 5387; II, 5388
Kamiyoshi, K. and Miyamoto, T. Dielectric properties of the water of crystallization, 6196. Moisture determination by dielectric measurement, 7840
Kamke, D. On the mechanism of the canal-ray discharge, 348: Erratum, 2720
Kammerer, A. Deviations from Hooke's law and the domain of stability, 1370. The viscosity and internal friction of solids, 3851
Kampen, N. G. van. *See* van Kampen, N. G.
Kan, Ya. S. *See* Galkin, A. A., 9486
Kanai, Y. Current amplification by [a] silicon *p–n* junction, 8740
Kanaya, K. *See* Sakurai, T., 4398
Kanazawa, H. Note on the classical equations of motion of nucleons, 5097. On tensor forces and saturation requirements, 6745
Kanda, E. Determination of the second virial coefficient and the van der Waal's force of methane, 3403. *See also* Haseda, T., 4351; Nomura, Y., 5361, 8694; Sugawara, T., 4338; Tsujikawa, I., 7721
Kanda, E., Ôtsubo, A. and Haseda, T. Some behaviours of supercooled liquid at low temperatures, 4160
Kanda, E. and Sugawara, T. The crystal structure of sulfur dioxide, 5923
Kanda, E. and Tsujikawa, I. Absorption spectrum of crystals at low temperatures. I. The effect of temperature on spectrum of benzene and its monoderivatives, 4259
Kanda, F. A. and King, A. J. The crystal structure of sulfamic acid, 8359
Kanda, T., Masuda, Y., Kusaka, R., Yamagata, Y. and Itoh, J. Measurement of the F^{19} magnetic moment, 9643
Kanekar, C. R. *See also* Prasad, M., 489, 6237
Kanekar, C. R. and Subrahmaniam, K. E. Optical properties of zirconium hydroxide gels, 8309
Kaneko, H. *See* Sato, T., 6208, 7854*
Kannuluik, W. G. and Donald, H. B. The pressure dependence of the thermal conductivity of polyatomic gases at 0°c, 2602
Kantrowitz, A. Nucleation in very rapid vapor expansions, 8690. *See also* Perry, R. W., 6802
Kantrowitz, A. and Grey, J. A high intensity source for the molecular beam. I. Theoretical, 5803
Kanzaki, H. Lattice defects in silver bromide, 5908. On the recovery process of cold worked metals, 7326
Känzig, W. X-ray investigation of barium titanate ferroelectricity, 5389
Kaplan, H. The determination of the energy of a ferromagnetic domain boundary, 4517
Kaplan, I. On the systematics of even–even alpha-emitters, 5710
Kaplan, J. Laboratory studies related to the physics of the upper atmosphere, 6646. *See also* Gerson, N. C., 3973
Kaplan, S. A. The time of rotational relaxation of the galaxy, 44. The cooling of white dwarfs, 50
Kaplon, M. F. The contribution of the Pauli moment to π-meson production by photons, 8201
Kapustin, A. P. The effect of ultrasonic vibrations on the polymorphic transformation of ammonium nitrate, 3410. An experimental investigation of the influence of ultrasonic waves on the kinetics of crystallization, 3906. The effect of ultrasonics on the rate of phase change in organic substances, 7329
Kar, K. C. and Chaudhury, M. L. The wave statistical theory of alpha-disintegration, 6422
Kar, K. C., Sengupta, S. and Chatterji, P. P. The relativistic theory of scattering in Coulomb field by atoms, 3343
Karal, F. C., Jr. *See* Horton, C. W., 1197, 1681, 5602
Karamyan, A. S. and Ter-Martirosyan, K. A. Position of the levels of hyperfine structure in a magnetic field, 6319
Karamyshev, M. A. *See* Smolenskiĭ, G. A., 9443
Karandikar, R. W. *See* Ramanathan, K. R., 6621
Karle, J. *See also* Hauptman, H., 1490, 1493, 9135
Karle, J. and Hauptman, H. A note on the solution of the structure-factor equations, 3921
Karlovitz, B., Denniston, D. W., Jr and Wells, F. E. Investigation of turbulent flames, 5355
Karmalkar, P. K. *See* Saxena, A. P., 1076
Kármán, T. de. *See* de Kármán, T.
Karman, T. von. *See* von Karman, T.
Karmen, K. N. *See* Kosman, M. S., 6955
Karp, S. N. Wiener–Hopf techniques and mixed boundary value problems, 6082
Karpenko, G. V. The question of the formation of fatigue microcracks, 3104
Karplus, R. and Neuman, M. Non-linear interactions between electromagnetic fields, 1609. The scattering of light by light, 7524
Karr, H. J., Bondelid, R. O. and Mather, K. B. Deutron-proton scattering at 10·0 Mev by a coincidence method, 2759
Karr, P. R. Radiation properties of spherical antennas as a function of the location of the driving force, 9618
Karraker, D. G., Ghiorso, A. and Templeton, D. H. Alpha-decay energies of polonium isotopes, 7224
Karraker, D. G. and Templeton, D. H. Radioactive isotopes of rubidium, 2942. Polonium isotopes produced with high energy particles, 4649
Kartha, G. Unit cell and space group of barium chlorate monohydrate, 9150
Kartuzhanskiĭ, A. L. and Meiklyar, P. V. Characteristics of the photographic emulsion for different durations of continuous exposure, 8412
Karush, W. *See* Hestenes, M. R., 9224
Kasha, M. Characterization of electronic transitions in complex molecules, 8103
Kasper, J. S., Decker, B. F. and Belanger, J. R. The crystal structure of the sigma-phase in the Co–Cr system, 3912
Kasper, J. S., Lucht, C. M. and Harker, D. The crystal structure of decaborane, $B_{10}H_{14}$, 1500
Kastha, G. S. *See* Sirkar, S. C., 2583
Kastler, A. Paramagnetic resonance and the effect of resonance on the magnetic birefringence of radio waves, 3639. The optical detection of electronic resonance by the observation of the paramagnetic rotation of the plane of polarization of visible light, 5617. Optical methods for the study of magnetic resonance, 7139. On the possibility of studying long-duration nuclear magnetizations and their relaxation, with simple methods, 8125. *See also* Blamont, J. E., 8384
Kastler, D. On the electronic exchange effects in the calculation of dipole moments. Degree of ionization and dipole moments of halogen hydrides, 8106
Kasyankov, P. P. Calculation of the aberrations of electrostatic lenses by the method of calculating trajectories, 2741. Conditions for the correction of astigmatism and of curvature of field in [axially asymmetric electrostatic] electron lenses, 7007
Katayama, S. *See* Yamaguchi, J., 1834–5

Katayama, T. and Kunitomi, N. On the change of reversible susceptibility of ferromagnetic substances due to tension, 4522

Katayama, Y. On the positron theory of vacuum, 3322. *See also* Tokuoka, Z., 7511

Katcoff, S., Schaeffer, O. A. and Hastings, J. M. Half-life of I^{129} and the age of the elements, 5696

Kato, K. *See* Kojima, S., 1822, 8724

Kato, N. and Uyeda, R. Dynamical theory of electron diffraction for a finite polyhedral crystal. I; II. Comparison with the results of kinematical theory, 7393

Kato, T. Variational methods in collision problems, 1616. On the adiabetic theorem of quantum mechanics, 2386

Kats, M. L. Luminescence of NaCl monocrystals, subjected to thermal treatment, 1748

Katsuki, K. *See* Hayashi, M., 1737

Katsumori, H. *See* Tanaka, T., 7144

Katsura, S. *See also* Watanabe, Y., 4492

Katsura, S. and Fujita, H. Some remarks on the condensation phenomena, 5133. Point of condensation and the volume dependency of cluster integrals, 6924

Katz, B. *See* Fatt, P., 2238

Katz, E. Note on frequency spectra of simple solids from specific heat data, 4572

Katz, L. *See also* Cameron, A. G. W., 2953, 9708; Haslam, R. N. H., 1996; Johns, H. E., 3021, 8776

Katz, L., Johns, H. E., Baker, R. G., Haslam, R. N. H. and Douglas, R. A. Photoneutron cross sections of Fe^{54}, Ni^{58} and Zn^{68}, 5770

Katz, L. and Lipscomb, W. N. The crystal structure of iron lazulite, a synthetic mineral related to lazulite, 9155

Katz, L. and Penfold, A. S. Determination of the photo-nuclear cross sections $S^{30}(\gamma, d)P^{30}$, $S^{32}(\gamma, np)P^{30}$, and $P^{31}(\gamma, n)P^{30}$, 4724; Erratum, 7272

Katz, S. *See* Kniebes, D. V., 7023

Katzin, L. I. Possible *f*-shell covalency in the actinide elements, 1457

Kaufmann, S. G. *See* Shoemaker, F. C., 8964

Kavraĭskiĭ, V. V. A wide-angle polariscope of great light-transmitting capacity with a doubling analyser, 6904

Kawabe, R. *See* Umezawa, H., 5081

Kawada, T. On the discontinuous elongation o aluminium crystal, I, 3093

Kawaguchi, M. Application of the M^2-expansion method to compressible flow past an elliptic cylinder, 8577

Kawai, H. and Tokita, N. On the Young's moduli and the internal friction of papers, 2091

Kawashima, S. On the vibrational and the impact of elastic cables, 3349

Kawata, S. A note on thermocouple anemometer, 9336

Kay, R. H. The interpretation of radiosonde data in relation to cosmic-ray intensity variation, 6308

Kay, R. L. *See* Davies, J. A., 7345

Kayas, G. *See* Duquesne, M., 1281

Kaye, W. Near infrared spectrophotometry with the Beckman model DU spectrophotometer, 4241

Keam, D. W. *See* McAlister, J. M., 2282; Wilson, A. R. W., 3767

Keating, D. T. and Warren, B. E. Long-range order in beta-brass and Cu_3Au, 3910

Keberle, E. Galilean approximation of the relativistic wave-particle attribution, 89. On the foundation of the exclusion principle, 860

Keberle, E. and Mercier, A. The relativistic behaviour of systems with or without self-constraint, 63

Keck, P. H. The electrical properties of selenium coatings, 4387

Keck, W. *See also* Williams, A. O., Jr, 5213

Keck, W., Heller, G. S. and Williams, A. O., Jr. Measurement of the underwater sound field generated by quartz transducers, 5199

Kedesdy, H. *See* Lehovec, K., 2690

Keen, R. *See* Malmstrom, C., 5833

Keenan, J. H. Availability and irreversibility in thermodynamics, 6936

Keene, J. P. An absolute method for measuring the activity of radioactive isotopes, 1287

Keepin, G. R., Jr. Search for Be^7 states using the Li^6 technique, 2995. Improvements in the Li^6 technique, 3055

Kegeles, G. and Gutter, F. J. The determination of sedimentation constants from Fresnel diffraction patterns, 9782

Kegley, C. L. *See also* Duckworth, H. E., 4618, 8909

Kegley, C. L., and Duckworth, H. E. Masses of krypton-82, -84 and -86 and xenon-129 and -132, 8150

Keihn, F. G. and King, A. J. The space group and optical constant of glucuronolactone, 9177

Keilson, J. The splitting of *l*-shells in heavy nuclei by the tensor interaction, 6392

Keith, H. D. Precision lattice-parameter measurements, 3205

Kell, R. C. *See* Brown, C. S., 7375

Kellar, J. N. *See* Gay, P., 6252; Hirsch, P. B., 6251

Keller, G. *See* Belzer, J., 3292

Keller, H. B. *See also* Burson, S. B., 7219; Cork, J. M., 8943

Keller, H. B. and Cork, J. M. Electron spectrum of Pa^{233}, 1280

Keller, J. B. *See also* Weitz, M., 3373

Keller, J. B. and Blank, A. Diffraction and reflection of pulses by wedges and corners, 9400

Keller, J. M., Koenigsberg, E. and Paskin, A. Ring focus in a thin magnetic-lens beta-ray spectrometer, 365

Keller, K. J. Dielectric losses and breakdown of ceramic materials. I. Electric conduction and breakdown of ceramic materials, 6952. Breakdown and electric conductivity of glass, 8760

Keller, K. K., Niedner, J. B., Wang, C. F. and Shull, F. B. Inelastic scattering of deuterons by C^{12}, 4713

Keller, R. Chemical binding of the proton measured with a slow neutron velocity selector, 3693

Keller, W. E. *See* Smith, A. L., 198, 4263

Kelley, G. G. *See* Bell, P. R., 6412

Kelley, J. B. Compressible flows, 4167

Kellner, L. The vibrations of an infinitely long chain of CH_2-groups and the infra-red spectrum of polythene, 6378

Kells, M. C. *See* Amdur, I., 2758

Kelly, F. M. *See also* Crawford, M. F., 2927

Kelly, F. M., Richmond, R. and Crawford, M. F. Spectroscopic value of the magnetic moment of ${}_{83}Bi^{209}$, 1978

Kelly, J. C. *See* Bruce, C. F., 6080

Kelly, J. M. Magnetic field measurements with peaking strips, 7061

Kelly, W. C. and Metzgar, K. J. Automatic operation of a beta-ray spectrometer, 9525

Kelso, J. M. The effect of the Lorentz polarization term on the vertical incidence absorption in a deviating ionosphere layer, 5612

Kemball, C. The reaction of methane and deuterium on evaporated nickel catalysts, 7344

Kendall, J. D. The role of sensitizing dyestuffs in the evolution of the photographic emulsion, 2277

Kendall, J. T. Electrical conductivity of gray tin, 313

Kendall, J. T. and Yeo, D. Magnetic susceptibility and anisotropy of mica, 3637

Kendrew, J. C. *See* Bragg, L., 526

Kennedy, A. J. *See* Andrade, E. N. Da C., 6516

Kenney, R. W. *See* McMillan, E. M., 4630

Kent, D. W. *See* Dainton, A. D., 411, 5532

Kentaro, Y. Studies of friction. I. About a newly designed apparatus for friction, 6050

Kenty, C. Production of 2537 radiation and the role of metastable atoms in an argon-mercury discharge, 1079. A new form of discharge in gas mixtures: the flashing discharge, 1080. Role of metastable $({}^3P_2)$Hg atoms in low current discharges in Hg rare gas mixtures, 1081

Kenty, C., Easley, M. A. and Barnes, B. T. Gas temperatures and elastic losses in low pressure mercury-argon discharges, 7922

Kenworthy, R. W. and Burnam, T. D. The absorption coefficients of fir plywood panels, 8606

Kepes, A. A new apparatus for the measurement of the elastic modulus and internal friction in solids, 3818

Keramsi, S., Lochet, R. and Rousset, A. Optical anistropy of molecules of benzene and of nitrobenzene dissolved in carbon tetrachloride, 9402

Kerner, E. H. The solution of the Schrödinger equation for an approximate atomic field, 6753

Kerns, D. M. Analysis of symmetrical waveguide junctions, 6363
Kerr, E. C., Rifkin, E. B., Johnston, H. L. and Clarke, J. T. Condensed gas calorimetry. II. Heat capacity of ortho-deuterium between 13·1 and 23·6°K, melting and boiling points, heats of fusion and vaporization. Vapor pressures of liquid ortho-deuterium, 3485
Kerr, R. H. and Lund, L. H. An atomic distribution function, 4151
Kerr, V. *See* Ungnade, H. E., 6861
Kerst, D. W. and Price, G. A. Yields of photo-neutrons with calorimetrically measured 320-Mev Bremsstrahlung, 617
Kessler, J. *See* Lederman, L. M., 8991
Kessler, K. G. *See also* Meggers, W. F., 1720
Kessler, K. G. and Meggers, W. F. The nuclear spin of $43Tc^{99}$, 3695
Kessler, M. *See* Lyons, H., 4268
Ketelaar, J. A. A. *See also* Romers, C., 3930; Salomon, G., 7728
Ketelaar, J. A. A. and Vedder, W. The infrared spectrum of KHF_2, 6124*
Ketelle, B. H. The Ca^{45} beta-distribution obtained in a split crystal scintillation spectrometer, 2967. *See also* Brosi, A. R., 586; Zeldes, H., 572, 4663
Ketelle, B. H., Brosi, A. R. and Zeldes, H. A two-day Xe^{133} isomer, 2000
Kettner, M. E. *See* Lagergren, C. R., 1258
Keuffel, J. W. *See* Harrison, F. B., 8227
Keulegan, G. H. Wind tides in small closed channels, 9307
Keussler, W. von. *See* v. Keussler, V.
Keyes, F. G. A summary of viscosity and heat-conduction data for He, A, H_2, O_2, N_2, CO, CO_2, H_2O and air, 7607. Measurements of the heat conductivity of nitrogen-carbon dioxide mixtures, 7804
Keyes, F. G. and Sandell, D. J., Jr. New measurements of the heat conductivity of steam and nitrogen, 251
Keys, J. D. *See* Henry, W. H., 8782
Keyser, G. M. Absorption corrections for radium standardization, 8911. *See also* McNeill, K. G., 4715
Khaĭdorov, A. *See* Abdullaev, A., 5547
Khaĭkin, M. S. Measurement of the surface resistance of superconducting tin at 9 380 Mc/s, 2699
Khalatnikov, I. M. *See* Abrikosov, A. A., 8509
Khasilev, V. Y. *See* Polisar, G. L., 2603
Khastgir, S. R. *See also* Das, P. M., 766; Satyanarayana, R., 9444
Khastgir, S. R. and Das, P. M. Periodic fading of short-wave radio signals, 3241
Khastgir, S. R., Tolpadi, S. K. R. and Mitra, S. C. Volume rectification in zincite, 8735
Khatset, F. I. *See* Neĭmark, I. E., 3161
Khilmi, G. F. *n*-Body problems in celestial mechanics and cosmogony, 1572. Completely unstable systems of *n* gravitating bodies, 8436. Evolution of a system of gravitating bodies by non-elastic collisions, 8448
Khin, L. S. *See* Rabin, B. M., 9518
Khinchin, Ya. A. On the distribution laws of "numbers of completion" in quantum statistics, 9285
Khodakov, A. L. Dielectric losses in ceramic dielectrics and barium titanate at high frequencies, 2673. *See also* Belyaev, I. N., 9807
Khodakov, G. N. *See* Verkhovskiĭ, B. I., 8818
Kholnov, Yu. *See* Dzhelepov, B., 6433, 9671
Khrebet, N. G. *See* Zatespin, G. T., 2785
Khrimyan, A. *See* Vaĭsenberg, A., 7951
Khristiansen, G. B. *See* Zatespin, G. T., 2785
Kichenassamy, S. On the width of $K\alpha$ lines, 5452
Kieffer, J. *See* Trébuchon, C., 1552, 3101
Kiehl, J.-P. Effect of the adsorption of gases on the rate of reduction of nickel [ous] oxide by tungsten, 6545. *See also* Forestier, H., 716
Kien Tcheng. *See* Tcheng Kien
Kienle, H. Matter and energy under cosmic conditions, 6005
Kiepenheuer, K. O. Cosmic rays as the source of general galactic radio emission, 24
Kigoshi, K. *See* Kakiuchi, Y., 8843
Kihara, T. Determination of intermolecular forces from the equation of state of gases. II, 8584
Kikindai, T. *See* Brusset, H., 1088
Kikuchi, C. Kramer's theorem and nuclear effects in paramagnetic absorption, 3635. *See also* Carr, E. F., 2512
Kikuchi, R. A method of approximation for co-operative phenomena, 748. A theory of co-operative phenomena, 5134
Kikuchi, S. The stars initiated by gamma-rays, 2029. The mechanism of star production by gamma-rays, 5768. On the photonuclear dissociation of nuclei by the high energy gamma-rays, 9706
Kikuchi, S. and Oda, Y. On the scattering of D–D neutrons by atomic nuclei, 4727
Kilburn, T. *See* Williams, F. C., 2301, 7450
Kilczer, J. The theoretical determination of travel time, 9181
Kilinski, E. von. *See* von Kilinski, E.
Kilmister, C. W. Tensor identities in wave-tensor calculus, 6754
Kilpatrick, J. E. A note on the vapour pressure of He^3, He^4 solutions, 267
Kilpatrick, J. E. and Kilpatrick, M. F. Discrete energy levels associated with the Lennard-Jones potential, 7153
Kilpatrick, M. *See* McKinney, C. D., Jr, 9052
Kilpatrick, M. F. *See* Kilpatrick, J. E., 7153
Kilpatrick, M. L. *See* Hillenbrand, L. J., Jr, 5852
Kimball, G. E. *See* Lewinson, V. A. 6374
Kimura, I. *See* Kumagai, S., 8692
Kimura, K. and Ikeda, N. The carrier-free extraction of radioactive indium from "Irradiated Unit Sb^{125}," 9680
Kimura, M. The thermal neutron scattering by ammonium chloride, 647. Temperature effect in Geiger–Müller counters, 2763. On the temperature effects of spurious counts in Geiger–Müller counters, 7962
King, A. J. *See* Clarke, S. G., 3945; Kanda, F. A., 8359; Keihn, F. G., 9177; Shineman, R. S., 2179
King, C. V. *See* Salzberg, H., 704
King, D. T. *See also* Hooper, J. E., 1296, 3740
King, D. T., Harris, J. E. and Tkaczyk, S. Liquid-emulsion method in electron track radiography, 4021
King, E. S. *See* Zigler, M. J., 5949
King, G. W. *See also* Allen, H. C. Jr, 1744
King, G. W. and Emslie, A. G. Spectroscopy from the point of view of the communication theory. I. Resolution, 6100
King, J. G. *See* Jaccarino, V., 8128
King, R. Theory of collinear antennas, 1198. Theory of V-antennas, 9617
King, R. B. *See* Hill, A. J., 5268; Makinson, R. E. B., 7912
King, S.-N., Chang, C.-H. and Peng, H. W. On the binding energies of the atomic nuclei ^2H, ^3H, ^3He and ^4He. II, 4594. *See also* Hainer, R. M., 1716
King, T. A. *See* Evans, J. C., 7657
Kingston, R. S. T. *See* Clark, L. N., 2597
Kinman, T. D. Interstellar matter, 4044
Kinoshita, T. On the interaction of mesons with the electromagnetic field, I, 77. Note on the infrared catastrophe, 5096; Erratum, 6735. *See also* Fukuda, H., 5084
Kinoshita, T. and Nambu, Y. On the interaction of mesons with the electromagnetic field. II, 5093
Kinsey, B. B. *See also* Bartholomew, G. A., 3741
Kinsey, B. B. and Bartholomew, G. A. Radiative capture of neutrons in deuterium, 3032
Kinsey, B. B., Bartholomew, G. A. and Walker, W. H. γ-Rays produced by slow neutron capture in beryllium, carbon, and nitrogen, 3752. Neutron capture γ-rays from lead and bismuth, 5728. Neutron capture γ-rays from fluorine, sodium, magnesium, aluminum, and silicon, 8177
Kinsey, V. E. Modification of the apparatus used for the Baldes thermoelectric method of measuring osmotic pressure, 119
Kinsler, L. E. and Frey, A. R. Fundamentals of acoustics, 4180
Kinumaki, S. Studies on glass surfaces. I. Migration of alkali ions through the surface layer, 6492
Kip, A. F. *See also* Tinkham, M., 8039
Kip, A. F., Davis, C. F., Jennings, L., Reiner, D. and Malvano, R. Paramagnetic resonance in some chrome alums at various temperatures, 9599
Kiral, A. *See* Gleissberg, W., 2332
Kirby-Smith, J. S. *See* Jones, E. A., 4251, 4283

Kirchgessner, W. G. A new deflection type densitometer, 5228

Kirchmayer, L. K. *See* Cook, A. C., 3260, 5977

Kirenskiĭ, L. V. The energetic anisotropy of nickel, 2829

Kirenskiĭ, L. V. and Ivlev, V. F. The phenomenon of counter inversion in ferromagnetics, 3642

Kirenskiĭ, L. V. and Slobodskoĭ, L. I. Influence of directional stresses on the form of the magnetization curve in strong fields, 2840

Kirkwood, J. G. *See also* Stripp, K. F., 8878

Kirkwood, J. G. and Auer, P. L. The visco-elastic properties of solutions of rod-like macromolecules, 4137

Kirkwood, J. G. and Buff, F. P. The statistical mechanical theory of solutions. I, 6071

Kirsch, K. *See* v. Brockdorff, U., 2404

Kiselev, A. V. *See* Avgul, N. N., 6546

Kiseleva, K. *See* Frisman, E., 2587

Kissinger, C. W. *See* Perlow, G. J., 4499

Kistemaker, J. *See also* Reinders, M. E., 9103, 9331

Kistemaker, J. and Zilverschoon, C. J. A magnetic ion source of the Heil-type, 4458

Kister, A. T. *See* Redlich, O., 689

Kistiakowsky, G. B. *See also* Gomer, R., 4831

Kistiakowsky, G. B. and Slichter, W. P. A high-intensity source for the molecular beam. II. Experimental, 5804

Kita, I. On the discharge mechanism of [the] slow counter, 5489. *See also* Fujioka, G., 5490, 5499

Kitahara, T. *See* Takeyama, H., 6147

Kitaigorodskiĭ, A. I. Accuracy of X-ray structural analysis of crystals, 2171

Kitchener, J. A. *See* Bockris, J. O'M., 4839

Kittel, C. Note on the inertia and damping constant of ferromagnetic domain boundaries, 2834. Theory of antiferroelectric crystals, 5386. Ferromagnetic resonance, 6315. Theory of antiferromagnetic resonance, 6347. Dipolar domains in paramagnetic crystals at low temperatures, 7070. Domain boundary motion in ferroelectric crystals and the dielectric constant at high frequency, 7836. *See also* Herring, C., 4525; Williams, H. J., 2824

Kiyono, T. Theoretical study on the ground resistivity method of electrical prospecting, 3959

Klages, G. Absorption of microwaves in gases and liquids, 199

Klages, G. and Kremmling, G. On the relaxation and association of polar chain molecules in the pure liquid, 5397

Klahr, C. N. Resistivity and Hall constant of semiconductors, 5406; Erratum, 7877

Klahr, C. N. and Hunter, L. P. Measurement of semiconductor impurity content, 5405

Klair, J. *See* Naimark, G. M., 7637

Klassen, J. *See* Plewes, A. C., 7810

Klee, H. *See* Witte, H., 8040

Klein, A. The coupling of a Dirac field to a Kemmer field, 5075

Klein, M. J. On order parameters, 4898

Klein, M. J., Cleveland, F. F. and Meister, A. G. Force constants, frequency assignments, and thermodynamic properties of ozone, 8099

Klein, M. J. and Smith, R. S. A note on the classical spin-wave theory of Heller and Kramers, 3622. Thin ferromagnetic films, 4528

Klein, M. W. *See* Smakula, A., 2075

Klein, S. Increased efficiency of the high power thermionic cell by superposition of a strong h.f. field, 8809

Kleinman, D. and Snow, G. The index of refraction for neutrons, 7296

Kleman, B. *See also* Glansholm, D., 936

Kleman, B., Lagercrantz, Å. and Uhler, U. The presumed $^1\Sigma^-$-term in AlH, 184

Klemenc, A. *See* Heinrich, G., 3981

Klemens, P. G. The thermal conductivity of dielectric solids at low temperatures (theoretical), 7803. *See also* Berman, R., 1793

Klemensiewicz, Z. On the unorthodox versions of the Le Chatelier-Braun principle, 2651

Klement, F. D. *See* Zelikin, Ya. M., 3448

Klement, O. Theoretical determination of electron density in organic molecules, 8876

Klemperer, O. On a new test method for spherical aberration of electron lenses, 9522

Klemperer, O. and Klinger, Y. On the spherical aberration of electron emission systems, 4433

Kleppa, O. J. Ultrasonic velocity of sound at 12 Mc in liquid sulfur, 908. Ultrasonic velocities of sound in some metallic liquids. Adiabatic and isothermal compressibilities of liquid metals at their melting points, 909

Klerk, D. de. *See* de Klerk, D.

Klick, C. C. *See also* Schulman, J. H., 971, 2559

Klick, C. C. and Maurer, R. J. The mobility of electrons in diamond, 2653

Klick, C. C. and Schulman, J. H. On the existence of "sub-bands" in the luminescence emission spectrum of manganese activated zinc silicate, 220

Kling, H. P. *See* Alexander, B. H., 4887

Kling, R. *See* Dubois, G., 7615

Kling, W. and Mahl, H. Electron microscopic investigation of textile fibres, 3808

Klinger, Y. *See* Klemperer, O., 4433

Klinkenberg, P. F. A. Analysis of the spectrum of doubly ionized thorium Th. III, 180. Shell structure of atomic nuclei, 1238. $^{176}_{71}$Lu and the nuclear shell model, 9637

Klinkenberg, P. F. A., van den Berg, G. J. and van den Bosch, J. C. Structure and Zeeman-effect in the spectrum of the tantalum atom Ta I, 3430. Note on the structure of the Ta I spectrum, 5250

Klumpp, R. G. *See also* Egan, J. P., 5214

Klumpp, R. G. and Egan, J. P. On the correspondence between the intensities of two tones for best beats, 4211

Klutke, F. The measurement of electrical conductivity of liquids without electrodes, 2693

Kluyver, J. C. *See* Milatz, J. M. W., 7754

Klyukin, I. I. Theory of sound-proofings, 1705. Experimental investigation of sound-proofings, 1706

Kmetko, E. A. Infra red absorption and intrinsic semi-conductivity of condensed aromatic systems, 5408

Knable, N. *See* Gardner, W. L., 9732

Kneser, H. O. On the damping of oscillating cylindrical rods by the surrounding medium, 6813. *See also* Adolph, R., 4177

Kniebes, D. V., Katz, S. and Bernstein, R. B. Mass spectrometer resolution of ion pairs of similar *m/e*, 7023

Knighting, E. Some meteorological aspects of radio duct formation, 4005

Knipp, J. K. *See also* Ling, R. C., 1143

Knipp, J. K., Leachman, R. B. and Ling, R. C. Ionization defects of fission fragments, 2059

Knipp, J. K. and Ling, R. C. On the ionization yields of heavy particles, 4485

Knol, K. S. Determination of the electron temperature in gas discharges by noise measurements, 8751

Knoll, J. E. *See* Eidinoff, M. L., 563

Knott, R. D. Isotope elastic discharge lamps as spectral sources for the exact measurement of length, 8615

Knowles, L. M. Thermal analysis of the system $PbBr_2$–PbO, 8689

Knowlton, J. W. and Prosen, E. J. Heat of combustion and formation of cyanogen, 7826

Knox, K. and Thomas, H. C. The Jones reductor: a model for the kinetics of chromatography, 4824

Knox, W. J. Multiple traversals of high energy particles in a cyclotron beam through thin targets, 4453. Relative high energy neutron yields from targets bombarded with protons and deuterons, 4705

Koana, Z. *See* Makishima, S., 4226

Koba, Z. Note on a Lorentz-invariant integration in the quantum field theory, 5079

Koba, Z., Kotani, T. and Nakai, S. Errata: Meson production by X-ray, 641

Kobayashi, D. *See* Itoh, J., 6255

Kobayashi, M. *See* Tsuchida, R., 6132

Kobe, K. A. *See* Pennington, R. E., 5376

Kobeko, P. P., Mikhailov, G. P. and Novikova, Z. I. The temperature-dependence of the dielectric constant of copolymers, 298. Determination of the dipole moment of copolymers, 299

Kobrynski, M. and Neyron, A. Principle and apparatus for measuring the acoustic transmission through samples of a partition, 4186

Koch, G. P., Taylor, W. J. and Johnston, H. L. A recording grating spectrometer with linear wavelength scale, 4233

Koch, H. P. The infra-red spectrum of tropolone, 4261

Koch, H. P. and Moffitt, W. E. Conjugation in sulphones, 3880

Koch, K. M. Remarks on the "nucleus" theory of superconductivity, 2698. The Corbino effect and the change of resistance in a magnetic field, 5621. The dependence of the ferromagnetic Curie point on the magnetic field, 8019

Koch, O. Remarks on the work of G. Schmitz: "On the breadth of wall-stabilized arc discharges," 357

Koch, O. and Dunstädter, H. A contribution to the measurement of temperature in wall-stabilized high-pressure mercury arcs, 4409

Koch, W. Measurement of wall temperatures, 9433

Koch, W. E. Binaural localization and masking, 2257

Koch, W. E. and Harvey, F. K. A photographic method for displaying sound wave and microwave space patterns, 9352

Kochendörfer, A. Dislocations as lattice states and their significance for the plasticity and growth of crystals. I, 6569, 9129. *See also* Schmitz, G., 4403

Kockel, B. and Wagenbreth, H. On the doublet splitting of alkali terms, 6841

Koechlin, Y. *See* Pichat, L., 7035

Koeckelenbergh, A. A model of the solar chromosphere in hydrostatic equilibrium, 6698

Koehler, J. S. *See* Neurath, P. W., 5832; Peach, M., 2094

Koehler, W. C. *See* Wollan, E. O., 8236

Koehler, W. F. A laboratory experiment on the determination of γ for gases by self-sustained oscillations, 4352

Koenig, E. G. Photoelectric analogue computer, 3262. An electric analogue computer using the photo cell as a nonlinear element, 6677

Koenig, S., Prodell, A. G. and Kusch, P. The anomalous spin gyromagnetic ratio of the electron, 8146

Koenigsberg, E. *See* Keller, J. M., 365

Koenigsfeld, L. and Piraux, P. A new portable electrometer for the measurement of electrostatic charges by electronic methods. Its application to the measurement of atmospheric potential and to the radiosonde, 8375

Koester, L. J. *See* Laubenstein, R. A., 9693

Kofink, W. A note on Planck's radiation formula, 7653. On the theory of the forked compression shock, 9332. *See also* Czerny, M., 922

Kofoed-Hansen, O. and Kristensen, P. β-recoil equipment with Kr^{89}, 5717. Maximum and mean energy of the recoil nucleus in the beta-decay of Kr^{89}, 7237

Kofoed-Hansen, O. and Nielsen, K. O. Short-lived krypton isotopes and their daughter substances, 5700*. Measurements on shortlived radioactive krypton isotopes from fission after isotopic separation, 7206

Kofsky, I. L. Atwood's machine and the teaching of Newton's second law, 8538

Kogan, S. Kh. Stimulation of a spiral line, 5607

Kohl, D. Scintillation-counter brain needle, 7037

Kohl, D., Moore, G. and Chou, S. A scintillation counter for clinical use, 9551

Köhler, H. On evaporation from snow surface, 1541

Kohler, M. The suppression of the thermoelectric effect at very low temperatures, 9497. *See also* Gehloff, P. O., 330; Justi, E., 9460, 9498, 9623

Kohn, J. A. *See* Ramsdell, L. S., 3926

Kohn, W. *See also* Silverman, R. A., 2880, 5630

Kohn, W. and Bloembergen, N. Remarks on the nuclear resonance shift in metallic lithium, 2524; Erratum, 4256

Kohn, W. and Vachaspati. A difficulty in Frölich's theory of superconductivity, 7908

Kohra, K. On the anomalies of the small angle reflection of cathode rays from the surface of a single crystal. III. The effect of absorption, 1096

Kohra, K., Uyeda, R. and Miyake, S. An exception to Friedel's law in electron diffraction. II. Theoretical consideration, 1519

Koi, Y. On the electromotive forces in tarnishing reactions, 6532

Kojima, S. and Kato, K. On the noise of Rochelle salt. II. Barkhausen effect, 1822. The noise of decaying electrets, 8724

Kojima, S. and Takayama, K. Probe measurements for high frequency discharge. II, 1864. Noise temperature of a d.c. gas discharge plasma, 3545

Kojima, Y. *See* Okamura, T., 3628, 5564, 8026

Kok, J. A. On electrostatic plasma oscillations in metals, 8851

Kokurin, Yu. *See* Azimov, S., 9568

Kokurina, A. S. *See* Nikitina, E. A., 755

Kolb, O. A new apparatus for searching and measuring particle-sensitive plates, 9901

Kolbuszewski, J. Notes on the deposition of sand, 661

Kolesnikov, N. N. and Blokhintsev, D. I. Bremsstrahlung of particles having a magnetic moment as well as spin, 9529

Koller, L. R. and Alden, E. D. Electron penetration and scattering in phosphors, 7777

Kołodziejski, R. Outline of a general theory of atomic collisions. I. Collisions of one particle with a system of particles, 7551

Kolomiets, B. T. Characteristics and properties of lead sulphide photo-resistances, 6977

Kolomoĭtsev, F. I. The change of the electrical properties of calcite in relation to its temperature luminescence, 3515

Kolontsova, E. V. Diffuse scattering of X-rays by plastically deformed monocrystals of aluminium, 3803

Kolpakov, P. E. and Terletskiĭ, Ya. P. The question of the distribution of the electromagnetic field of spots in the sun's atmosphere, 3283

Kolsky, H. *See also* Crawford, S. M., 3469

Kolsky, H. G., Phipps, T. E., Jr, Ramsey, N. F. and Silsbee, H. B. Radiofrequency spectrum of H_2 in a magnetic field, 203. Radiofrequency spectrum of D_2 in a magnetic field, 1740. The deuteron quadrupole moment and the radiofrequency spectra of H_2 and D_2 in low magnetic fields, 5672

Komatsu, H. *See* Kakiuchi, Y., 4375, 8843

Komelkov, V. S. The development of electrical discharge in long gaps, 336

Komelkov, V. S. and Lifshits, A. M. Influence of barriers on the development of the electrical discharge in long gaps, 2714

Komoss, S. G. El. *See* El Komoss, S. G.

Kondaiah, E. Disintegration of Ru^{103}, 570. Disintegration of ${}_{56}Ba^{131} \rightarrow {}_{55}Cs^{131} \rightarrow {}_{54}Xe^{131}$, 594. Disintegrations of Nd^{147} and Pm^{149}, 6409. Disintegration of Ce^{143} and Pr^{143}, 8929

Kondaiah, K. Disintegration of the 15-day osmium, 5714

Kondic, V. *See* Yao, T. P., 107

Kondo, K. On the properties of [a] ferromagnetic alloy of manganese and bismuth at low temperatures. II. Electrical conduction and galvanomagnetic effects, 1925. On the dislocation, the group of holonomy and the theory of yielding, 2103

Kondo, S. and Suita, T. Absorption spectra of colored potassium chloride containing several kinds of impurities, 194. Dielectric dispersion of alkali halide crystals, 2671

Kondorskiĭ, E. Single domain structure in ferromagnetics and magnetic characteristics of finely dispersed substances, 2830

König, H. "Schlieren" optics in the electron microscope, 3559. Carbonization of organic objects by electrons, 7308

König, H. and Helwig, G. Thin films produced by electronic and ionic bombardment of hydrocarbons, 8252

König, H. W. Matter and quantum properties of electromagnetic wave-fields, 7521

Konkov, V. L. *See* Samoĭlovich, A. G., 6320

Konstantinova, V. P. and Chormonov, T. Kh. The effect of purification on the ferroelectric properties of crystals of Rochelle salt, 2668

Kónya, A. *See* Hoffmann, T. A., 7143

Koomen, M., Scholnik, R. and Tousey, R. A study of night myopia, 4969

Koops, C. G. On the dispersion of resistivity and dielectric constant of some semiconductors at audio-frequencies, 6964

Koot, J. H. P. Time measurement by the Joergensen–Weibel method, 2405

Kopal, Z. *See* Carrus, P. A., 3300, 6714

Kopelman, B. and Gregg, C. C. Particle agglomeration in tungsten metal powder, 9737

Kopfermann, H. Nuclear moments and nuclear models, 4596. *See also* Brix, P., 1244, 4597

Kopineck, H.-J. Exchange and other two-centre integrals with 2*s* and 2*p* wave-functions, 1218*. Two-centre integrals with 2*s* and 2*p*-functions. II, 8089

Koppe, H. The scattering of a particle on a potential-well, 7565. On the phenomenological theory of superconductivity, 9489

Koppe, H. and Bryan, J. M. On the theory of the Hall effect, 8865

Korff, S. A. Proportional counters. II, 3585; III, 4468. Cosmic-ray neutrons, 4516. *See also* Staker, W. P., 5535

Korff, S. A. and Beers, Y. The solar atmosphere and the origin of radiofrequency radiation, 3279

Kori, T. *See* Nishihara, T., 4809

Korn, T. General theory of intelligibility in rooms, 916

Kornelsen, R. O. *See* Johns, H. E., 9880

Kornetzki, M. A relation between dielectric constant and loss angle of ferro-electric materials, 2667. The dielectric constant of barium titanate, 3512. Measurements on ferrite cores of high permeability, 5562

Kornhauser, E. and Stakgold, I. Application of the calculus of variations to the problem $\nabla^2 u + \lambda u = 0$, 4551

Kornhauser, E. T. Propagation on dielectric coated wires, 4544. Radiation field of helical antennas with sinusoidal current, 7124

Korringa, J. Nuclear magnetic relaxation and resonance line shift in metals, 1229. Accurate determinations of nuclear moments and atomic constants, 1247

Korsching, H. Diffusion apparatus for gas separation, 7606

Korshunov, A. V. The scattering spectra and lattice symmetry of certain crystals with space group C_{2h}^5, 2565

Korshunov, A. V. and Selkin, V. A. Use of illuminators in the investigation of low-frequency Raman spectra of organic crystals, 2564

Korsunskiĭ, M. I. and Fogel, Ya. M. On the focusing of a molecular beam by a non-uniform magnetic field, 5801

Korsunskiĭ, M. I., Pivovar, L. I. and Markus, A. M. Detection of the molecular beam on the basis of the change in the electrical conductivity of the [metallic] condensate, 8996

Kortüm, G. On the appearance of rotational and vibrational structure in gas and liquid spectra, 8629

Kortüm, G. and Kortüm-Seiler, M. Solubility of iodine in solvent mixtures, 2429

Kortüm, G. and Luck, W. Quantitative studies of the absorption in the visible bands of bromine and iodine vapours, 6125. Studies of the visible absorption band of bromine vapour, 7691

Kortüm, G. and Weller, A. State of solvation of ions in liquid mixtures, I, 1426. II. Transport measurements for lithium picrate in water-ethanol-mixtures, 3139

Kortüm-Seiler, M. *See* Kortüm, G., 2429

Koshevnik, A. Yu. *See* Kusakov, M. M., 2422

Koski, W. S. Scintillations in some phosphor-plastic systems, 4294. *See also* Wentink, T., Jr, 5677

Kosman, M. S. and Goldshtein, T. D. Investigation of the polarization of barium titanate by the method of the transverse field, 6945

Kosman, M. S. and Karmen, K. N. Piezoelectric characteristics of Seignette salt in the direct piezo-effect, 6955

Kosman, M. S. and Sozina, A. N. New temperature relations for Seignette salt, 6958

Kossmann, C. E. *See* Briller, S. A., 1549

Kostarev, A. L. Theory of the temperature dependence of the fine structure of X-ray absorption spectra of solids, 7928

Kosten, L. Probability calculus in telecommunication, 3264. On the accuracy of measurements of probabilities of delay and of expected times of delay [in telephone systems], 4039

Kotani, T. *See* Koba, Z., 641

Kotera, A. *See* Yamasaki, K., 2085

Kothari, L. S. *See* Auluck, F. C., 5092, 7492

Kotschak, O. *See* Hanle, W., 6882

Kottler, F. The distribution of particle sizes, 1338, 3060

Koudijs, B. *See* Bogaardt, M., 8805

Kourganoff, V. On the anisotropy of radiation in stellar atmospheres, and the errors that result in "the Eddington approximations," 4062. Exact source functions by an extension of Chandrasekhar's limiting process, 5051. *See also* Chalonge, D., 4060

Kouvelites, J. S. and McKeehan, L. W. Magnetostrictive vibration of prolate spheroids. Preliminary measurements, 4567

Kovács, I. The evaluation of the rotational constants for diatomic molecular levels from perturbation data. II, 7673. *See also* Budó, A., 7672

Kovács, I. and Lagerqvist, A. Perturbations in the spectrum of barium oxide, 1726. Perturbations in the BaO spectrum, 2516

Kovaleva, T. V. *See* Sevchenko, A. N., 6888

Kovner, I. A. *See* Biberman, L. M., 371

Kovner, M. A. and Salosin, V. T. Vibration spectrum and force constants of diacetylene, 3687

Kovner, M. A. and Tsimring, Sh. E. On the theory of the continuous spectrum of methane and related molecules, 8630

Kowalewski, D. G. and Kowalewski, V. J. On a method for the calibration of photographic emulsions, 2273

Kowalewski, V. J. *See* Kowalewski, D. G., 2273

Kowarski, L. *See* Benoist, P., 8206

Kozhevnikova, N. V. *See* Smolenskiĭ, G. A., 5385

Kozyrev, N. A. Internal constitution of large planets, 9236

Kraft, L. G. Correlation function analysis, 2483

Kragelskiĭ, I. V. and Shevetsova, E. M. Types of process of deterioration in dry friction conditions, 3105

Kraichman, M. *See* McGinnis, C. S., 6817

Kramer, J. Experiments with a Geiger point counter on worked non-metals, 2657. Research with a Geiger point counter on irradiated crystals, 4288

Kramer, R. L. *See* McMillen, J. H., 872, 3353

Kranendonk, J. van. *See* van Kranendonk, J.

Kranjc, A. Intermediate atmospheres in closed binaries, 7490

Krasnushkin, P. E. Theory of waves and oscillations in inhomogeneous discrete structures (inhomogeneous wave filters), 6079

Krasovskiĭ, V. I. On the mechanism of the illumination of the night sky, 6644. Counting of oscillations as a method of astronomical investigation, 8439. Influence of water vapours and carbon oxides and nitrogen on the luminescence of the night sky, 9852. *See also* Lukashenya, V. T., 9853

Kraus, G. and Thiem, J. R. A simplified air flow method for the determination of the surface area of powders, 104

Krause, B. *See* Hückel, E., 5890

Krause, R. Measurement of ultrasonic fields in fluids, 163

Krautz, E. Spectroscopic investigation of the behaviour of oxide cathodes in gaseous discharges, 5511. On the influence of reduction processes on the luminescence mechanism of fluorescent magnesium orthotitanate and ruby, 9388

Kravtsov, V. A. The formula for the mass-spectrometer of Alikhanov and Alikhanyan, 7951. Shells in heavy nuclei and binding energies of nucleons, 8887. Shells in light nuclei and binding energies of nucleons, 8888

Krawitz, E. *See* Green, L. C., 7192

Krc, J., Jr. Sodium stannate $Na_2Sn(OH)_6$, 5924. Sodium metaborate dihydrate, $NaBO_2 . 2H_2O$, 8357. Chrysene, 9162

Krebs, H. Semi-conducting materials. On the crystallisation of semi-metals and the formation of lattice defects, 7888

Krebs, K. The "pendulum multiplication" of secondary electrons in h.f. fields, 1109

Kreger, W. E. *See* van Nordstrand, R. A., 9787

Kreidl, N. J. Glasses transparent to X-rays, 9887

Kremmling, G. *See* Klages, G., 5397

Krenz, F. H. On the mechanism of indirect action, 7334

Kretzmer, E. R. An application of auto-correlation analysis, 4119

Krey, T. An approximate correction method for refraction in reflection seismic prospecting, 9186
Krichevskiĭ, I. R. and Tsiklis, D. S. A method of determining the compressibility of gases at high pressure, 9328
Kripyakevich, P. I. The relationship between lattices of the types NiAs and Ni_2In and certain orthorhombic lattices, 9829
Krishnaji. Determination of elastic constants of solids by pulse method, 1362
Krishnamurti, K. A new adsorption isotherm, 5877
Krishnamurty, B. Ultrasonic studies in electrolytes. I. Alkali halides, 116; II. Effect of including the electrolyte in a circuit, 9316
Krishnamurty, S. G. *See* Fernando, I., 7669
Krishnamurty, T. S. G. and Satyanarayanarao, S. Normal modes of ethane, 1743
Krishnan, K. S. Anharmonicity of the lattice oscillations in the alkali halide crystals, 747
Krishnan, K. S. and Roy, S. K. The frequencies and the anharmonicities of the normal modes of oscillation of alkali halide crystals. I. Lattice oscillations, 7379
Krishnan, R. S. Raman spectra of the second order in crystals. V. Aragonite, 223
Krishnan, R. S. and Chandrasekharan, V. Thermal scattering of light in crystals. I. Quartz, 238
Krishnan, R. S. and Kumari, C. S. Raman spectrum of anhydrite, 981
Kristensen, P. *See* Kofoed-Hansen, O., 5717, 7237
Kristenson, H. Spectrophotometric determinations of contact at total eclipses of the sun, 6702
Kristiansson, K. *See* von Friesen, S., 778, 9719
Krivoglaz, M. A. and Tolpygo, K. B. The problem of the relation between contact resistance and contact p.d., 8737
Kröger, F. A. *See also* Bril, A., 970
Kroeger, F. A. and van den Boomgaard, J. The fluorescence of magnesium germanate activated by manganese, 1749
Krohmer, J. S. and McCarthy, W. A. A simple laboratory setup for rapid measurement of β-ray dosages above 1 rep/sec., 5719
Kroll, W. D. *See* Levy, S., 2406
Kron, G. E. and Smith, J. L. Red and infrared magnitudes for 125 stars in ten areas, 5035
Krone, R. W., Hanna, S. S. and Inglis, D. R. Angular yield of both proton groups from $Li^6(d, p)Li^7$, 2036
Kröner, K. and Pungs, L. The dielectrical anisotropy of natural wood over a wide frequency range, 286
Kronig, R. and Bruijsten, J. On the theory of the heat and mass transfer from a sphere in a flowing medium at low values of Reynolds' number, 8683
Kronig, R. and Thellung, A. On the theory of the propagation of sound in He II, 1807
Kronquist, E. *See* Giansoldati, A., 8906
Krueger, H. H. A., Meneghetti, D., Ringo, G. R. and Winsberg, L. Small angle scattering of thermal neutrons, 2070
Krug, W. and Lau, E. A new method of interference microscopy, 5342. An interference microscope for use with transmitted or reflected light, 6159
Krüger, G. *See* Lehmann, H. A., 7356
Krüger, H. *See* Becker, G., 6385; Dehmelt, H. G., 7147
Kruger, P. G. *See* Jentschke, W. K., 6894; Phillips, J. A., 2046; Smith, L. W., 9008; Taylor, C. J., 6893
Kruglova, M. D. and Sokolskaya, I. L. Thermionic emission of platinum coated tungsten, 5508
Kruis, A. *See* Macek, O., 1005
Kruithof, A. A. *See* de Groot, W., 998–9
Krumbein, A. D. An anomalous effect observed in self-quenching counters containing neon, 385
Krumholz, P. A medium resolution replica grating spectrophotometer, 6840
Krupka, F. *See* Horák, Z., 1008
Krupp, H. Determination of the most general solution of the Schrödinger equation for a Coulomb-potential, 8535
Kruse, F. W., Jr. *See* Helliwell, R. A., 6634
Kruse, U. E. *See* Birge, R. W., 7026
Krushchev, M. M. and Berkovich, E. S. An experiment on the use of the electron microscope to measuring particularly small imprints, obtained in micro-hardness testing, 3805
Kruyer, S. The lowest energy of symmetric configurations, 717
Kryder, S. J. *See* Birnbaum, G., 2664
Krylova, E. S. Investigation of the mechanism of the luminescence of zinc phosphors when weakly excited, 6879
Krystanov, L. A case of the enlargement of cloud drops by fusion, 3986
Kryukov, I. A. On the calculation of pulse-size and dead-time of Geiger counters, 8792
Krzywoblocki, M. Z. On the asymptotic expansion in three-dimensional compressible viscous flow, 884. On complete forms in a turbulent three-dimensional flow of compressible viscous fluid, 7614
Kubaschewski, O. The diffusion rates of some metals in copper, silver and gold, 659
Kübler, E. Derivation of the phenomenon of electromagnetic induction from the theory of relativity, 4539
Kubo, T. and Akabori, H. A new type of high-temperature X-ray camera for chemical reactions in the solid state, 3199
Kubota, H. On sensitive color, 994, 5336
Kubota, H. and Ara, T. Further study on the interference color, 4306
Kubota, H., Ara, T. and Saito, H. On the sensitive color of chromatic polarization, 7786
Kuczynski, G. C. *See also* Cohen, G., 1343; Dedrick, J. H., 1342
Kuczyinski, G. C. and Alexander, B. H. A metallographic study of diffusion interfaces, 3801
Kuczynski, G. C. and Landauer, R. Measurement of carbon diffusion in metallic carbides, 7306
Kuhlmann, D. On the theory of plastic deformation, 3097
Kuhlmann, D., Masing, G. and Raffelsieper, J. On relaxation theory, 3826
Kuhn, G. *See* Schopper, E., 6310–11
Kuhn, H. Viscosity, sedimentation, and diffusion of long-chain molecules in solution as determined by experiments on large-scale models, 1437. New techniques in optical interferometry. I–V, 7780
Kuhn, H. and Wilson, B. A. Reflectivity of thin silver films and their use in interferometry, 229
Kuhn, H. and Woodgate, G. K. The spin and magnetic moments of the rhodium nucleus, 1980
Kühne-Sauter, E. A concentration-dependent H–D exchange process at the surface of aluminium cathodes, 1070
Kuhrt, F. On the vapour pressure of small droplets, 8586
Kuiper, G. P. Planetary and satellite atmospheres, 25. On the origin of the solar system, 5014. On the evolution of the protoplanets, 9235
Kujirai, H. *See* Kwan, T., 8313
Kukharkin, E. S. Notes on the pre-discharge displacement current in long spark gaps, 1069
Kukoz, L. A. *See* Novosiltsev, N. S., 7831
Kulchitskiĭ, L. A. The relation between the directions of emission of α-particles and γ-quanta in the transition ThC $\rightarrow$ ThC″, 2963
Kulchitskiĭ, L. A., Latyshev, G. D. and Bulyginskiĭ, D. G. Angular correlations of short-range alpha particles and gamma quanta, 583
Kulenkampff, H. On the resultant effect of X-ray transmission through many equivalent layers, 6999
Kulenkampff, H., Scheer, M. and Schittenhelm, R. Investigations of the spatial distribution of X-ray bremsstrahlung from a 5-MeV betatron, 5467
Kulikov, A. M. *See* Vernov, S. N., 447
Kulkarni Dzhatkar, S. K. and Gopalasvami, S. N. Dielectric permittivity of ferroelectrics. II. KH_2PO_4, $NH_4H_2PO_4$, KH_2AsO_4, $NH_4H_2AsO_4$, 6198
Kulkarni Dzhatkar, S. K. and Yatiradzha Iengar, B. R. Dielectric permittivity of ferroelectrics. I, 6197. Dielectric permittivity of associating liquids, 6199
Kulkarni Jatkar, S. K. *See* Kulkarni Dzhatkar, S. K.
Kumagai, H., Ôno, K., Hayashi, I., Abe, H., Shimada, J., Shômo, H. and Ibamoto, H. Inter-ionic distances and line widths in paramagnetic resonance absorption, 9600
Kumagai, H., Ōno, K., Hayashi, I., Abe, H., Shôno, H., Tachimori, S., Ibamoto, H. and Shimada, J. Microwave resonance absorption in manganese sulfates, 7097

Kumagai, S. and Kimura, I. Effect of turbulence on flame propagation in gases, 8692
Kumari, C. S. Raman spectrum of potassium chlorate and its temperature variation, 982. *See also* Krishnan, R. S., 981
Kumm, A. and Wolf, F. Charges from rime layers and their contribution to the electrification of thunderclouds, 9861
Kümmel, H. The energy-momentum vector in the unitary divergence-free quantum electrodynamics, 4087
Kummer, J. T. and Emmett, P. H. Exchange between N_2^{30} and N_2^{28} over iron catalysts, 4814
Kundu, D. N. *See* Young, J. N., 9655
Kunesch, A. M. Orbital rockets. III. Conception of an instrument-carrying orbital rocket, 6763
Kung, S.-M. On the relative intensity of first-order Stark components, 7670
Kun Huang. *See* Huang, K.
Kunin, L. L. Formulae for calculating the surface tension of metals, 9308
Kunin, R. Ion exchange, 3853
Kunimune, M. The mutual repulsive potential between argon atoms, 556
Kunitomi, N. *See* Katayama, T., 4522
Kunkel, H. A. A method of carrying out *in vivo* tracer measurements with radioactive isotopes, 5946
Kunkel, W. B. Comment on static electrification of dust particles on dispersion into a cloud, 2656
Kunz, W. E. *See* Good, W. M., 8957
Kunzel, H. *See* Grotrian, W., 3284
Kunzler, J. E. *See* Giauque, W. F., 2647
Kuper, C. G. An unbranched laminar model of the intermediate state of superconductors, 9495
Kupka, F. and Sienko, M. J. The magnetic susceptibility of tungsten bronzes, 1181
Kupperian, J. E., Jr, Murray, P. C. and Feeny, H. A note on the successive peaks of spurious counts in G–M tubes, 4460
Kurath, D. Effect of finite range interactions in the (jj) coupling shell model, 1966
Kurbatov, J. D. *See also* Dale, E. B., 2987; Emmerich, W. S., 6431, 7218, 7246; Kurbatov, M. H., 5884; Sorensen, B. M., 1269; Zimmerman, E. L., 2982
Kurbatov, M. H., Wood, G. B. and Kurbatov, J. D. Application of the mass law to adsorption of divalent ions on hydrous ferric oxide, 5884
Kuritsyna, E. F. On the temperature dependence of magnetic viscosity of ferromagnetic metals, 9607. *See also* Telesnin, R. V., 3644
Kurnosova, L. and Tikhonova, N. Measurement of the altitude variation of electron-nuclear showers, 438
Kursunoglu, B. Space-time on the rotating disc, 2362. On Einstein's unified field theory, 5064
Kurth, R. Estimation of the masses of globular- and nebulae-clusters on a dynamical basis, 2340. The mass of the Milky Way system, 2349. The mass of the globular clusters, 8464. The evolution of the globular clusters, 8465
Kürti, N. Antiferromagnetism at low temperatures, 6349
Kusaka, R. *See* Kanda, T., 9643
Kusakov, M. M., Lubman, N. M. and Koshevnik, A. Yu. The influence of pressure and temperature on the surface tension of crude oil, 2422
Kusch, P. Hyperfine structure by the method of atomic beams. Properties of nuclei and of the electron, 7188. *See also* Koenig, S., 8146; Logan, R. A., 4608; Prodell, A. G., 1257
Kushida, T. On the anomalous electrical properties of β-Cu_2S. II, 1050. Electromotive force in tarnishing reaction of Cu by S, 6533
Kushida, T. and Inoue, N. On the rectification of cuprous sulphide, 9467
Kushneriuk, S. A. and Preston, M. A. The scattering phase shifts of two-nucleon systems, 8234
Kustaanheimo, P. On the differential effect of the galactic rotation, 5999
Kusukawa, K. The foundation of the quantization of turbulence, 6076*. Discussion of the spectrum of turbulence, 8548. On the theory of shock waves produced by a rigid wedge moving through an elastic medium with supersonic velocities, 8581. On the theory of shock waves produced by a rigid cone moving through an elastic medium with supersonic velocities, 8582
Kusumoto, O. *See* Watase, Y., 8825
Kuvshinskiĭ, E. V. Equations of motion of an incompressible elasto-viscous medium, 9034
Kuwabara, S. *See* Tazaki, H., 6495, 9742
Kuwahara, G. *See* Ishiguro, K., 5316–17
Kuznetsov, A. Ya. *See* Evstropev, K. S., 6212
Kuzukawa, K. The spectrum of turbulence, 2453
Kvitka, S. S. and Umanskiĭ, M. M. X-ray goniometry from polychromatic exposures of a stationary crystal, 3204
Kwal, B. Electromagnetic waves emitted by fast protons in strong magnetic fields, and the relation between cosmic rays and the radiofrequency noise of the sun and galaxy, 1577. Generalized potentials in the theory of spin-one particles in presence of sources, and the fundamental difficulty of meson theory, 2382. Some consequences of radiation by very rapid particles in a magnetic field, 3574. On the electromagnetic radiation of cosmic protons in the intense magnetic fields of celestial objects, 4050. Fundamental equations of the new form of meson theory, 5122. The covariant methods of analytical mechanics in the general theory of fields, linear or otherwise, 7513. On a covariant method of local quantization in the general theory of fields, 7518. Use of potentials and antipotentials in the canonical scheme of the theory of the electromagnetic field, 8051. E.m. radiation of large wavelength in a strongly ionized medium, 8059. On the possibility of interpreting the radio "noise" of the Sun and the galaxy as radiation from cosmic-ray protons in the intense magnetic fields of the Sun and other celestial objects, 8447. Pressure of radiation in non-linear electrodynamics, 9356
Kwal, B. and de Broglie, L. Some considerations on gauge transformations and the definition of Hertz vectors in the theory of Maxwellian particles of spin 1, 7538
Kwan, T. Adsorption of carbon dioxide on reduced nickel, 1451
Kwan, T. and Kujirai, H. Absolute rate of the chemisorption of hydrogen on reduced copper, 8313
Kwoh, T.-C. and Eyring, H. Optical rotatory power of benzoin, 240
Kynch, G. J. A note on exchange magnetic moments, 5109
Kyoya, S. *See* Kakiuchi, Y., 4375

LaBerge, W. B. *See* Munick, R. J., 2776, 4489
Laberrigue-Frolow, J. On the β^+/β^- branching-ratio of $^{80}_{35}Br$, 6423. *See also* Hubert, P., 8939
Labeyrie, J. Improvement of Geiger–Müller counters containing CO_2, 5487. A Geiger–Müller photocounter, with Fe/Ni cathode for u.v. radiation, 7961
Labrum, N. R. *See* Minnett, H. C., 807
Labus, J. Space-charge effects in h.f. modulated electron beams, 7012
Lacaze, J. Theory of formation of descending currents of cumulo-nimbus, 7414
Lacher, J. R. *See* Scruby, R. E., 4280
Lack, J. M. *See* Perryman, E. C. W., 4303
Laclavère, G. *See* Tardi, P., 7498
Lacombe, P. *See* Berghezan, A., 1351; Mouflard, M., 3096, 8266
Lacourt, A., Sommereyns, G. and Wantier, G. Paper chromatography of inorganic substances. The separating power of the saturating and developing organic solvents, 8332
Lacroix, R. *See also* Ryter, C., 951
Lacroix, R. and Extermann, R. A method for measuring paramagnetic absorption and dispersion, 7087
Lacroix, R., Ryter, C. and Extermann, R. Paramagnetic resonance and dispersion, 1185
Lacroix, R. P., Ryter, C. E. and Extermann, C. R. A method for measuring paramagnetic absorption on small samples, 2837
Lacy, R. E. *See* Pratt, A. W., 2195, 9191
Lafargue, C. On the freezing of droplets of water and of aqueous solutions, 4942. *See also* Godard, L., 1068
Lafferty, J. M. Boride cathodes, 1892, 3602
Laffineur, M. and Pecker, C. Radioelectric emission due to the gyromagnetic effect in a discharge, 2719
Laffitte, P. *See* Delbourgo, R., 7336

Lafitte, E. Luminescence of dyestuffs in solid solution in plexiglass, 5295
Laforgue, A. On the translation into the method of molecular orbitals of electronic links between non-adjacent atoms, 534
Lafoucrière, J. 3-Dimensional distribution of charged particles in an inhomogeneous magnetic field. Application to β-spectrography, 6258. *See also* Moussa, A., 8768; Thibaud, J., 8783
Lagarrigue, A. *See also* Peyrou, C., 3603
Lagarrigue, A. and Peyrou, C. Experimental determination of the energy spectrum of electrons from μ-meson decay, 9718
Lagemann, R. T. and Jones, E. A. The infrared spectrum of sulfur hexafluoride, 5286
Lagercrantz, Å. *See* Kleman, B., 184
Lagergren, C. R. and Kettner, M. E. Isotopic constitution of thulium, 1258
Lagerqvist, A. *See also* Hultin, M., 3437; Kovacs, I., 1726, 2516
Lagerqvist, A., Lind, E. and Barrow, R. F. The band-spectrum of barium oxide, 188
LaGrone, A. H., Benson, W. H., Jr and Straiton, A. W. Attenuation of radio signals caused by scattering, 5611
Lahaye, E. Contribution to the solution of the equations of motion of a fluid and of the equations of general atmospheric circulation, 3362
Lai, K. C. Ultrasonic velocity in organic solutions. II, 7635
Laidler, K. J. The activated complex in heterogeneous catalysis, 1417. *See also* Herman, R. C., 1723; Weber, J., 2122, 4815, 9047
Laing, K. M. and Fitzgerald, J. V. Glass film bolometers, 7651
Laird, R. K., Andrews, E. B. and Barrow, R. F. The absorption spectrum of CF_2, 972
Laitone, E. V. Experimental measurement of incompressible flow along a cylinder with a conical nose, 2445
Lal, B. *See* Mukerji, S. K., 7767
Lal, D. and Taylor, H. J. An unusual π–μ decay track, 638
Lal, H., Thirsk, H. R. and Wynne-Jones, W. F. K. A study of the behaviour of polarized electrodes. I. The silver/silver halide system, 3865
Lal, K. C. Ultrasonic velocities in organic solutions, 117, 3409
Lal, S. *See* Om Prakash, 2604
Lallemand, A. and Duchesne, M. An ideal photon receiver. Preliminary results, 8607
Lallement, C. *See* Caillat, R., 5492
Lamarche, G. *See* Demers, P., 1166
Lamb, J. and Andreas, J. H. Ultrasonic absorption in carbon disulphide, 7631
Lamb, M. A. *See* Plyler, E. K., 1741, 9378
Lamb, W. E., Jr. Anomalous fine structure of hydrogen and singly ionised helium, 7682
Lamb, W. E., Jr and Retherford, R. C. Fine structure of the hydrogen atom. I, 554; II, 3708
Lambeir, R. *See also* van Itterbeek, A., 6209
Lambeir, R., van Itterbeek, A. and van den Berg, G. J. Measurements on the electrical resistivity of thin films at liquid helium temperatures, 3530
Lambert, G. E. V. *See* Harding, H. G. W., 6643
Lambert, J. D. *See also* Craven, P. M., 3391
Lambert, J. D. and Rowlinson, J. S. Ultrasonic dispersion in organic vapours, 1672
Lambert, J. M. *See* Davidson, H. R., 2550
Lambert, R. F. Wael viscosity and heat conduction losses in rigid tubes, 7634. *See also* Hartig, H. E., 4185
Lambinet, M. *See* Soutif-Guicherd, J., 3671
La Mer, V. K. *See also* Pound, G. M., 5155
La Mer, V. K., Inn, E. C. Y. and Wilson, I. B. The methods of forming, detecting and measuring the size and concentration of liquid aerosols in the size range of 0·01 to 0·25 microns diameter, 2139
Lamerton, L. F. Radiotherapeutic physics. VI. Some aspects of the problem of dosage estimation in X-ray treatment, 9885
Lamont, H. R. L. Frequency stabilization by microwave absorption, 6852
Lampert, M. *See* Goldstein, L., 7126, 8853
Lampi, E. A rotating lithium target, 7022
Lampi, E. E., Freier, G. D. and Williams, J. H. The total scattering cross section of neutrons by hydrogen and carbon, 3030
Lamport, J. E. *See* Cleveland, F. F., 957
Lancaster, F. W. and Gordy, W. Paramagnetic resonance absorption of microwaves, 8846
Lancaster, J. E., Inskeep, R. G. and Crawford, B. L. The infrared spectrum of $H_2C{=}CD_2$, 6128
Lanczos, C. An iteration method for the solution of the eigenvalue problem of linear differential and integral operators, 2292
Land, G. The effect of film errors on astrometric accuracy, 19
Landau, L. D. *See* Berestetskiĭ, V. B., 7561
Landauer, R. Associated Legendre polynomial approximations, 2291. Reflections in one-dimensional wave mechanics, 4118. Conductivity of cold-worked metals, 5402. Maximum rate of wave function amplitude change, 6043. *See also* Kuczynski, G. C., 7306
Landé, A. On advanced and retarded potentials, 1608. Quantum mechanics, 5069
Lander, J. J. The crystal structures of NiO . 3BaO, NiO . BaO, $BaNiO_3$ and intermediate phases with composition near $Ba_2Ni_2O_5$; with a note on NiO, 3932
Landgraf, F. K. *See* Zapffe, C. A., 686
Landon, H. H. A proton-gamma-ray coincidence study of Si^{30} and B^{11}, 8927
Landsberg, P. T. Notes on operators

$$F = \sum_{k=0}^{k=n} F_k(x)\left(\frac{d}{dx}\right)^k, \quad 2$$

Characteristics of selenium photocells, 2697. The theory of direct-current characteristics of rectifiers, 5410. Contributions to the theory of heterogeneous barrier rectifiers, 5411. On matrices whose eigenvalues are in arithmetic progression, 7444
Landsberg, P. T., Mackay, R. W. and McRonald, A. D. The parameters of simple excess semiconductors, 6214
Landshoff, R. Convergence of the Chapman Enskog method for a completely ionized gas, 6790
Lane, T. B. Scuffing temperatures of boundary lubricant films, 3837
Lane, W. R. Shatter of drops in streams of air, 8556
Lang, C. S. *See* Ehrenberg, W., 7021
Langer, L. M. *See also* Bruner, J. A., 584; Bunker, M. E., 1998, 2974; Duffield, R. B., 3731
Langer, L. M. and Moffat, R. D. Radioactivity of Ga^{66}, 2959. The twice-forbidden transition of Cs^{137} and the law of beta-decay, 5716
Langer, L. M., Moffat, R. D. and Price, H. C., Jr. Further investigation of the radioactivity of Sb^{124}, 590
Langer, R. E. Asymptotic solutions of a differential equation in the theory of microwave propagation, 7127
Langevin, A. Changes of magnetic permeability of carbon steels and pure iron under tension in an alternating magnetic field of constant amplitude, 7142
Langevin, A., Reimbert, M. and Paul, E. The variation of the magnetic permeability of ordinary steels under the influence of mechanical tension, 2878
Langham, E. M. *See* Bell, J., 2199, 9198
Langseth, A. *See* Brodersen, S., 7698
Langstroth, G. O. *See also* Luchak, G., 2610
Langstroth, G. O., Diehl, C. H. H. and Winhold, E. J. The evaporation of droplets in still air, 2611
Lanzl, E. F. *See* Luce, W. M., 3246
Lanzl, L. H. and Hanson, A. O. *Z* dependence and angular distribution of bremsstrahlung from 17 MeV electrons, 8778
Laporte, M., Roerich-Goussu, O. and Déjean, J. Application of white light flash tubes: cinemicrography with high speed flashes in ordinary and phase contrast microscopy, 4322
Larach, S. and Shrader, R. E. Cathodoluminescence of zinc orthosilicate with manganese activator, 3455
Larenz, R. W. Concerning a method for the measurement of very high temperatures in nearly transparent arc columns, 6237. Measurements of column temperature in Gerdien arcs, 6238
Larke, L. W. *See* Rotherham, L., 688

Lark-Horovitz, K. Semi-conducting materials. Nucleon bombarded semi-conductors, 7860. *See also* Cleland, J. W., 6969; Crawford, J. H., Jr, 315; Johnson, V. A., 7860, 7875

Larnaudie, M. Calculation of the fundamental vibration frequencies of cyclohexane, 2894, 3439

Larsson, K.-E. and Taylor, C. A small BF_3 ionization chamber for absolute neutron measurements, 7030

Lasday, A. H. Total neutron cross sections of several nuclei at 14 MeV, 3780

Lashkarev, V. A. Diffusion of carriers of current in semiconductors with compound conductivity, 2684

Lashkarev, V. E. Investigation of the kinetics of photoconductivity of semiconductors by a compensation method, 1833

Lashko, N. F. The correspondence principle in the theory of plastic deformation, 2098*. Failure of metals as a consequence of dislocations, 2099

Laslett, L. T. *See* Jensen, E. N., 2943

Lassen, N. O. Total charges of fission fragments in gaseous and solid media, 1313. The total charges of fission fragments in gaseous and solid stopping media, 8210

László, Z. Some newer experimental results on the osmosis in alternating electric fields, 4152. Osmosis in a high frequency electric field, 6069

Lataste, A. *See* Jacquesson, J., 7248

Latimer, W. M. Methods of estimating the entropies of solid compounds, 5373. *See also* Hugus, Z. Z., Jr, 8281; Powell, R. E., 8566

Latter, A. L. A scattering approximation, 9278

Lattimore, S. Latitude effect of cosmic ray stars, 455. Calculations on the number of neutrons in the atmosphere, 4513. Rate of production of neutrons in ice by cosmic rays, 5542

Latyshev, G. D. The question of fine structure of the γ-lines of RaC′, 2015. *See also* Kulchitskiĭ, L. A., 583

Lau, E. *See* Krug, W., 5342, 6159

Laubenstein, M. J. W. *See* Laubenstein, R. A., 9693–4; Richards, H. T., 8790

Laubenstein, R. A. *See also* Mobley, R. C., 2045

Laubenstein, R. A. and Laubenstein, M. J. W. Assignment of angular momenta to the energy levels of F^{17}, 9694

Laubenstein, R. A., Laubenstein, M. J. W., Koester, L. J. and Mobley, R. C. The elastic scattering and capture of protons by oxygen, 9693

Lauber, A. *See* Furrer, W., 4215

Lauder, I. *See* Grigg, E. C. M., 3854

Lauderdale, R. A. and Emmons, H. A. Decontamination of small volumes of radioactive water, 8402

Laue, M. von. *See* von Laue, M.

Lauer, J. L. Correction for light absorption in fluorescence and light scattering measurements, 7758

Lauer, J. L. and Rosenbaum, E. J. Photoelectric measurement of fluorescence spectra of highly colored liquids, 6890

Laufer, A. R. The orientation of paramagnetic and diamagnetic rods in magnetic fields, 5556

Laufer, J. Investigation of turbulent flow in a two-dimensional channel, 9299

Laughlin, J. S. Considerations in the use of a 23-MeV medical betatron, 6666

Laughlin, J. S. and Beattie, J. W. Calorimetric determination of the energy flux of 22·5-MeV X-rays, 8766

Laughlin, J. S., Harvey, R. A., Haas, L. L., Lindsay, J. E. and Beattie, J. W. Physical aspects of rotation therapy with the betatron. I, 7438

Launey, J. de. *See* de Launey, J.

Laurent, P. Processes of germination in solid solutions, 2074

Laurent, P. and Eudier, M. Crystalline interaction and the hardness of metals, 664

Laurikainen, K. V. On the gravitational energy of the matter-free electromagnetic field, 829. *See also* Hulthén, L., 7448; Nilsson, S. B., 1600

Lauriston, A. C. and Welsh, H. L. Selective reflection from the vapors of the alkali metals, 7757

Lauritsen, C. C. *See* Brown, A. B., 4710; Li, C. W., 8152; Snyder, C. W., 1115

Lauritsen, T. *See* Hornyak, W. F., 2911

Lauritzen, J. I., Jr. *See* Shenker, H., 8746

Lauterjung, K. H. Current integrators for counter tubes, 2769

Lautout, M. Phosphorescence of sodium chloride, 6883

Lautz, G. *See* Justi, E., 9460, 9498

Lauwerier, H. A. The calculation of the coefficients of certain asymptotic series by means of linear recurrent relations, 8424

Laval, M. J. Elasticity of crystals, 7313

Lavetelli, L. *See* Davenport, L. L., 8781

Lavrenchik, V. *See* Barshchevskiĭ, B., 7829

Law, P. G., McKenzie, C. D. and Rathgeber, H. D. Cosmic ray measurements between Australia and Japan, 446

Lawford, A. L. and Veley, V. F. C. Variations in the length of the day, 6009

Lawhead, R. B. and Rudnick, I. Acoustic wave propagation along a constant normal impedance boundary, 8592. Measurements on an acoustic wave propagated along a boundary, 8593

Lawrance, R. B. and Strandberg, M. W. P. Centrifugal distortion in asymmetric top molecules. I. Ordinary formaldehyde, $H_2C^{12}O$, 7154

Lawrence, A. S. C. *See* Jobling, A., 5142

Laws, J. M. *See* Hawkes, D. H., 1533, 9197

Lawson, A. W. On heat conductivity in liquids, 1796. *See also* Christie, R. W., 4350; Smith, A. H., 4330

Lawson, A. W. and T.-Y. Tang. A diamond bomb for obtaining powder pictures at high pressures, 2167

Lawson, J. D. *See* Goward, F. K., 1093

Lawson, J. S., Jr. *See* Phillips, J. A., 2046

Lawton, H. The domain structure of ferromagnetic crystals, 5588

Lax, B., Allis, W. P. and Brown, S. C. The effect of magnetic field on the breakdown of gases at microwave frequencies, 1075

Lax, M. Neutron refraction in ferromagnets, 2071. *See also* Levitas, A., 5205

Lax, M. and Feshbach, H. Production of mesons by photons on nuclei, 3772

Layton, D. N. *See* Evans, D. M., 3190; Finch, G. I., 5821

Lazarev, B. G. *See* Eselson, B. N., 6928–9, 9420; Galkin, A. A., 9486–7; Verkin, B. I., 488, 3624, 9607

Lazarus, D. and Chipman, D. R. Vacuum furnace for metal single crystals, 4878

Leach, S. *See* Chauvin, H., 2518

Leachman, R. B. On the ionization yields of fission fragments, 7285. *See also* Knipp, J. K., 2059

Leader, G. R. The dielectric constant of formamide, 5392. *See also* Dawson, L. R., 6530

Leah, A. S., Godrich, J. and Jack, H. R. S. Thermal radiation and chemiluminescence from explosion flame gases, 1760

Leah, A. S., Rounthwaite, C. and Bradley, D. Some extensions in the use of resistance thermometry in the study of gaseous explosions, 2638

Léauté, A. Loss of mass by evaporation in liquids containing hypothetical [figure] bodies, 6167

Lebedinskiĭ, A. I. Theory of the formation of stars, 9250. Largest possible masses of single stars and formation of multiple systems, 9251. *See also* Gurevich, L. E., 2305, 2317–18

LeBel, C. J. and Dunbar, J. Y. Ultra speed recording for acoustical measurement, 8605

Le Blan, L. *See* Boutry, G. A., 5227

LeBlanc, J. M. *See* Cork, J. M., 573, 577, 2017, 5708, 8926, 8943, 9672

Lebon, E. Note on the temperature of Encke's comet, 5021

Le Bot, J. *See* Helaine, A., 3505

Lebowsky, F. *See* Hagen, C., 4153

Leck, J. H. *See* Blears, J., 7612

Le Claire, A. D. Grain boundary diffusion in metals, 5813. Anelastic measurements of diffusion coefficients in f.c.c. substitutional solid solutions, 8242

Lecolazet, R. New measurements of the atmospheric electric field by a glider, 4914

Le Compte, G. *See* Verhaeghe, J., 2827

Lecomte, J. Infra-red adsorption spectra of metallic acetyl-acetonates, 7724. *See also*, Duval, C., 7731; Pascal, P., 7714

Le Couteur, K. J. *See also* Hughes, J., 1240

Le Couteur, K. J. and Zienau, S. Coherent scattering of light by an atom and negative energy states, 846

Le Croissette, D. H. *See also* Yarwood, J., 4337

Le Croissette, D. H. and Yarwood, J. The gas-filling and some characteristics of bromine-quenched Geiger–Müller counters, 7964
Lecuir, R. Physico-chemical phenomena in the ceramic industry, 8245
Leddicotte, G. W. and Reynolds, S. A. Activation analysis with the Oak Ridge reactor, 7367
Leder, L. B. *See* Groetzinger, G., 4749
Lederman, L. *See also* Bernardini, G., 3048, 5738, 9725
Lederman, L., Tinlot, J. and Booth, E. T. On the decay of the π^- meson, 3790
Lederman, L. M., Booth, E. T., Byfield, H. and Kessler, J. On the lifetime of the negative Pi-meson, 8991
Ledinegg, E. and Urban, P. On some results in the theory of coupled electromagnetic cavity resonators, 2850. Loss-angle measurements on high dielectric-constant materials, 3514
Ledinegg, E., Urban, P. and Reder, F. On a new method for the measurement of dielectric constants of liquids of low conductivity in the cm-wave region, 287
Lee, B. S. Some effects of side-tone delay, 915. Effects of delayed speech feedback, 1703
Lee, G. L. and Le Roy, D. J. The mercury ($^3P_1$) photosensitized reaction of atomic hydrogen with methyl chloride, 705
Lee, J. K. *See* Moore, W. J., 5856, 9056
Lee, P. A. *See* Stewardson, E. A., 3552
Lee, R. J. and Fowler, R. G. Rayleigh afterglow in hydrogen discharges, 4406
Lee, T. D. Note on the proton-proton reaction in white dwarf stars, 3301. Difference between turbulence in a two-dimensional fluid and in a three-dimensional fluid, 4145. Erratum: Hydrogen content and energy-productive mechanism of white dwarfs, 6715
Leech, J. W. *See* Bates, D. R., 1890
Lees, C. S. and Armitage, M. D. A circuit for the automatic stabilization of X-ray tube current, 1091
Lees, D. J. *See* Goward, F. K., 3026
Lees, G. M. Heat flow in the earth (disc.), 3219
Lefebvre, R. On the electronic levels of polyacenes, 8093
Lefèbvre, S. G. The dualism of crystalline and amorphous states in the structures of high polymers, 7300
Le Fèvre, R. J. W. *See* Angyal, C. L., 2900; Barclay, G. A., 1036, 8883
Lefort, M. Decomposition of water by alpha radiation, 9773. *See also* Bonet-Maury, P., 2134
Legallais, V. *See* Chance, B., 9054
Legendre, R. Certain solutions of the equations of plane flow of a fluid under an approximate law of compressibility, 2442
Léger, A. E. *See* Watson, J. H. L., 1461
Lehan, F. W. Expected number of crossings of axis by linearly increasing function plus noise, 7846
Lehany, F. J. and Yabsley, D. E. A correction: "Solar radiation at 1 200 Mc/s., 600 Mc/s., and 200 Mc/s.," 809
Lehman, G. W. *See* James, H. M., 7860
Lehmann, H. The regularization of classical electrodynamics, 5087
Lehmann, H. A. and Krüger, G. Production of pure selenium trioxide, 7356
Lehmann, R. *See* Chavasse, P., 2487, 4011
Lehovec, K. Origin of a time-lag effect in selenium rectifiers, 6217. Recovery of selenium rectifiers after a voltage pulse in the blocking direction, 6976
Lehovec, K., Accardo, C. A. and Jamgochian, E. Injected light emission of silicon carbide crystals, 8654
Lehovec, K. and Kedesdy, H. Graphical determination of the Fermi level in a simple impurity semiconductor, 2690
Leibfried, G. Atomic theory of elasticity, 6503
Leibhardt, E. A dividing gear for a ruling engine, 864
Leigh, C. H. *See also* Szwarc, M., 5888
Leigh, C. H., Sehon, A. H. and Szwarc, M. The C–Br bond dissociation energy in substituted benzyl bromides, 9794
Leigh, R. S. A calculation of the elastic constants of aluminium, 3088. A theory of the $\alpha_1\alpha^1$ phases in the Al–Zn system, 8406
Leighton, R. B., Wanless, S. D. and Alford, W. L. On the decay of neutral *V*-particles, 8810
Leininger, R. F. *See also* Hollander, J. M., 2954
Leininger, R. F., Segrè, E. and Wiegand, C. E. Erratum: Experiments on the effect of atomic electrons on the decay constant of Be^7. II, 4634
Leisegang, S. *See* Blunck, O., 2728
Leitch, L. C. *See* Herzberg, G., 4274
Leiter, H. A. *See* Jennings, B., 2038
Leith, C. E. *See* Fox, R., 1329; Hildebrand, R. H., 3029; Richardson, R. E., 8963
Leitner, A. and Spence, R. D. Effect of circular ground-plane on antenna radiation, 521
Lejay, P. The indirect effect and the interpretation of gravity anomalies, 8487
Lejay, P., Ardillon, J.-M. and Bertaux, G. Relation between terrestrial magnetism and the propagation of radio waves between Washington and Bagneux, 8066
Lejay, P. and Lepechinsky, D. Formation of ionized layers. Influence of the temperature, 8378
Leland, W. T. and Agnew, H. M. Evidence for an excited state of He^5, 6460
LeLevier, R. *See* Finkelstein, R., 6742
Lemaître, G. Mechanical models of nebular clusters, 8468
Lement, B. S., Roberts, C. S. and Averbach, B. L. Determination of small thermal expansion coefficients by a micrometric dilatometer method, 4331
Lemmens, M.-L. *See* Balasse, G., 6107
Le Montagner, S. *See* Helaine, A., 3505
Lempicki, A. The electrical conductivity of simple *p*-type semiconductors, 6961
Lempicki, A. and McFarlane, A. B. Silicone oil vapour and secondary electron emission, 7019
Lengyel, B. A. A note on reflection and transmission, 3656. Reflection and transmission at the surface of metal-plate media, 3658
Lennard-Jones, J. The energies and bond lengths of conjugated molecules. An introductory review of theoretical developments, 7160. *See also* Hall, G. G., 3684
Lennard-Jones, J. and Pople, J. A. Molecular association in liquids. I. Molecular association due to lone-pair electrons, 2432
Lennartz, A. Effect of variations of intensity and voltage on the accuracy of colour measurement, 7793
Lennuier, R. and Cojan, J.-L. Measurement of the mean life of the resonance level 6^3P_1 for different isotopes of mercury, 2515
Lenoble, J. *See* Chanu, J., 7688
Lenormant, H. and Hérisson, M. Infrared spectrum of aneurin and cocarboxylase, 5276
Lenouvel, F. A photoelectric stellar photometer, 3269
Lenz, F. Calculation of the optical constants of magnetic electron lenses with a generalized bell shaped field, 1103. Calculation of optical constants of magnetic electron lenses from pole-piece dimensions and operating conditions, 2732. An analytical approximation of axially symmetric potential fields with cylindrical equipotentials, 3558. The ratio of proton and electron masses, 5382. Calculation of the field-distribution along the axis of a magnetic electron lens from pole-piece measurements and total flux, 5455. *See also* Glaser, W., 7009
Leo, W. and Hübner, W. Thermocouples and high-sensitivity photocell compensation for radiation measurement, 2489
Leonard, B. R., Jr, Anderegg, J. W., Kaesberg, P., Shulman, S. and Beeman, W. W. On the size, shape and hydration of southern bean mosaic virus and tobacco necrosis virus in solution, 7426
Leopold, L. B. and Mordy, W. A. 1948–1949 trials of the Schaefer–Langmuir cloud-seeding technique in Hawaii, 6641
Lepechinsky, D. *See* Lejay, P., 8378
Lepri, F., Moruzzi, G. and Pancini, E. A pulse generator specially adapted for research in electrophysiology, 3245
Leprince-Ringuet, L. Nuclear events of very high energy in cosmic rays, 599. Cosmic rays, 6295
Lerner, J. *See also* Jaffey, A. H., 5706
Lerner, J. L. and Uecker, D. F. An automatic plate counter, 8801
Le Roy, D. J. *See* Dingle, J. R., 3132; Lee, G. L., 705
Leslie, D. C. M. Collision broadening at microwave frequencies, 2535
Lessor, A. E. *See* Canada, R., 6441

Lethersich, W. The rheological properties of dielectric polymers, 1378. Apparatus for the study of creep of dielectric polymers and their dynamic rheological properties, 1379

Letort, M. and Pétry, J. Initiation of the polymerization of acetaldehyde into polyacetaldehyde, 723. Relationship between the conditions of crystallization of acetaldehyde and its polymerization, 725

Lettau, H. On the heat budget of the moon and the surface temperature variation during a lunar eclipse, 5015

Le Van, W. I. *See* Cunningham, G. L., Jr, 6126

Levedahl, W. J. *See* Broida, H. P., 6927

Levenberg, T. M. *See* Gorokhovskiĭ, Yu. N., 9906

Levenson, G. I. P. *See* Holden, A. V., 9891

Lévêque, S. *See* Merland, A., 4220

Leverenz, H. W. Research on high intensity phosphor light source, 7776. *See also* Harvey, R. L., 1179

Levert, P. *See* Bellet, E., 3168

Leverton, W. F. and Dekker, A. J. Hall coefficient and resistivity of thin films of antimony prepared by distillation, 1827. Hall coefficient and resistivity of evaporated bismuth layers, 3516

Lévi, F. The effect of additional binding forces, introduced after loading, in a visco-elastic solid, 7324

Levin, B. J. *See* Gurevich, L. E., 4055

Levina, L. E. *See* Andreev, V. D., 5444

Levine, H. The wavelength of a spherical resonator with a circular aperture, 5212

Levine, H. and Papas, C. H. Theory of the circular diffraction antenna, 2860

Levine, H. and Schwinger, J. On the theory of electromagnetic wave diffraction by an aperture in an infinite plane conducting screen, 7114

Levine, H. B. *See* Gutowsky, H. S., 1225

Levine, O. *See* Derstein, M., 3493

Levine, S. On the interaction of colloidal particles. IV. General mathematical theory for two identical particles, 2136; V. Nature of repulsion between particles in dilute sols, 2137; VI. Application of the Stern theory of the double layer, 9780. The free energy of the double layer of a colloidal particle, 9789

Levine, S. and Suddaby, A. Simplified forms for free energy of the double layers of two plates in a symmetrical electrolyte, 3861. Free energy of the double layers of two plates at large separations, 5863

Levine, S. W. *See also* Beattie, J. A., 6923

Levine, S. W. and Okamoto, A. H. Determination of sulfur in petroleum fractions by X-ray absorption, 8329

Levinger, J. S. The high energy nuclear photoeffect, 9709

Levinson, S. *See* Hermans, J. J., 6901

Levinthal, C. and Silverman, A. Production of protons by high energy γ-rays, 7268

Levinthal, E. C., Rogers, E. H. and Ogg, R. A., Jr. Paramagnetic resonance in alkali metal solutions at low fields, 7098

Levintov, I. I. *See* Verkhovskiĭ, B. I., 8818

Levitas, A. and Lax, M. Scattering and absorption by an acoustic strip, 5205

Levitskaya, M. A. A mode of partition of the structure of atomic nuclei, 2910

Levy, F. *See* Dilworth, C. C., 467

Levy, G. B. Automatic measurement of optical rotation, 9403

Levy, G. B., Schwed, P. and Fergus, D. A recording polarimeter, 241

Levy, M. Wave equations in momentum space, 1625

Levy, S. and Kroll, W. D. Response of accelerometers to transient accelerations, 2406

Levy, S. and Truell, R. The influence of magnetization on ultrasonic attenuation in a single crystal of nickel or iron-silicon, 7636

Lewartowicz, E. Overvoltage in the cerous-ceric oxidation-reduction system, 6535

Lewinson, V. A. and Kimball, G. E. Application of a modified quantum-mechanical cellular method to the hydrogen molecule, 6374

Lewis, E. A. and Casey, J. P. Metal grid interference filter, 7118

Lewis, E. M. Models in structural stress analysis problems, 100

Lewis, H. W., Brown, W. W., Seevers, D. O. and Hones, E. W. A cloud-ionization chamber for the study of cosmic-ray nuclear interactions, 4469

Lewis, R. E. Graphical ray-trace and surface generation methods for aspheric surfaces, 6829

Li, C. W. *See also* Whaling, W., 3764

Li, C. W. and Whaling, W. Cross sections and Q-values for $C^{13} + D^2$ reactions, 6455

Li, C. W., Whaling, W., Fowler, W. A. and Lauritsen, C. C. Masses of light nuclei from nuclear disintegration energies, 8152

Li, J. C. M. Concerning the temperature coefficient of the emf of reversible galvanic cells operated at variable concentration, 8299

Li, T. T. Double stars due to cosmic rays, 1170

Li, Y.-Y. On the ordering effect of antiferromagnetism, 1921. Natural spread of the conic distribution of the Čerenkov radiation, 5468–9

Liang, C.-Y. *See* Nielsen, J. R., 7712

Liang, S. C. Some measurements of thermal transpiration, 2435

Libby, W. F. *See* Anderson, E. C., 2935, 4627; Grosse, A. V., 6396; Martell, E. A., 2945

Liberman, A. M. *See* Cooper, F. S., 7645

Libin, I. Sh. *See* Vulfson, K. S., 6988

Libkind, M. S. Errors in calculations carried out by a calculating board, 13

Lichtman, S. W. *See* Friedman, H., 9202

Licklider, J. C. R. The intelligibility of amplitude-dichotomized, time-quantized speech waves, 1702. A duplex theory of pitch perception, 6662. *See also* Huggins, W. H., 5955

Liddel, U. Present state of nuclear physics, 3760

Lide, D. R. and Coles, D. K. Microwave spectroscopic evidence for internal rotation in methyl silane, 2526

Lidiard, A. B. On the theory of free electron ferromagnetism, 9590

Liebermann, L. The effect of temperature inhomogeneities in the ocean on the propagation of sound, 8594

Liebhafsky, H. A. X-ray absorption, 3896

Liebmann, G. A method for the mapping of vector potential distributions in axially symmetrical systems, 1174

Liebson, S. H., Bishop, M. E. and Elliot, J. O. Fluorescence decay of scintillation crystals, 3450

Liebson, S. H. and Farrar, R. T. Temperature characteristics of naphthalene-anthracene mixtures, 213

Lieseberg, C. *See* Ritter, O., 7939

Lieser, K. H. *See* White, H., 8040

Lifschitz, I. Rotary dispersion of metallic oxymethylenecamphor complexes, 1781

Lifshits, A. M. *See* Komelkov, V. S., 2714

Lifshits, I. M. *See also* Eselson, B. N., 6929

Lifshits, I. M. and Parkhomovskiĭ, G. D. The theory of the propagation of ultrasonic waves in polycrystals, 1669

Light, J. H. *See* Rank, D. H., 242

Lighthill, M. J. Reflection at a laminar boundary layer of a weak steady disturbance to a supersonic stream, neglecting viscosity and heat conduction, 892. The energy distribution behind decaying shocks. I. Plane waves, 1673. On the instability of small planetary cores. II, 3275. *See also* Goldstein, S., 868

Lihl, F. Ferromagnetic properties of partially oxidized Fe and Fe–Co powders, 9593

Likhacheva, O. A. *See* Avgul, N. N., 6546

Lilienthal, L. J., Jr. *See* Talbot, S. A., 4200

Liljeblad, R. The mode of operation of the uranium reactor, 5791

Lillie, D. W. The AEC in solid-state metallurgy, 4770

Lima, F. W. On the viscosity of liquid hydrocarbon mixtures, 4142

Lima-de-Faria, J. Method for obtaining a sharp meniscus of separation of ions, and determination of their mobilities, 6531. Acceleration of certain chemical reactions under the action of an electric field, 9766

Limber, D. N. Numerical results for pressure-velocity correlations in homogeneous isotropic turbulence, 5148

Lin, C. C. *See* Foote, J. R., 3366

Lin, W.-G. Microwave filters employing a single cavity excited in more than one mode, 8057

Lind, D. A. *See* Hedgran, A., 6442

Lind, E. *See* Hulthén, E., 235; Lagerqvist, A., 188

Lindars, P. R. *See* Griffith, R. H., 1399

Lindberg, P. J. *See* Ingelstam, E., 5296

Linde, J. O. *See* Gerritsen, A. N., 8727, 8744

Lindenbaum, S. *See* Blau, M., 3759

Lindenbaum, S. J. *See* Bernardini, G., 2998, 8181

Lindenfeld, P. *See* Perez-Mendez, V., 2947, 8162

Linder, E. G. Sheath formation in ion-neutralized electron beams, 1110

Linder, E. G. and Hernqvist, K. G. Space-charge effects in electron beams and their reduction by positive ion trapping, 369

Lindig, O. *See* Eckardt, A., 219

Lindner, M. and Coleman, J. S. The identification of W^{188} formed in neutron-activated tungsten by a chemical separation of Re^{188}, 5699

Lindquist, C. G. and Sierichs, W. C. The measurement of the flow properties of a pseudoplastic with a concentric cylinder viscometer, 9295

Lindquist, R. A survey of recent ionospheric measurements at the ionospheric and radio wave propagation observatory at Kiruna, 2203

Lindsay, J. E. *See* Laughlin, J. S., 7438

Lindsey, G. R. *See* Devons, S., 1302

Lindström, G. An experimental investigation of the nuclear magnetic moments of D^2 and H^1, 7182. An absolute determination of the *F*, *I*, and *L* lines of Th $(B + C + C'')$, 8930

Lindström, O. Thermistors as used in ultrasonic interferometry, 6084

Ling, R. C. *See also* Knipp, J. K., 2059, 4485

Ling, R. C. and Knipp, J. K. Ionization by recoil particles from alpha-decay, 1143

Lingafelter, E. C. *See* Anderson, T. H., 3928; Bierlein, T. K., 9174

Lingane, J. J. Polarographic theory, instrumentation and methodology, 3885

Link, F. Exploration of the upper atmosphere by meteors, 6625. Optical soundings of the upper atmosphere with the help of lunar eclipses, 6648. The possibility of optical sounding of the high atmosphere using twilight phenomena, 6649

Linnett, J. W. Comments on: Factors affecting bond strengths. I. A possible new definition of electronegativity; II. Empirical relations involving force constants and ionization potentials, 7157. *See also* Grove, J. R., 259; Hoare, M. F., 2896

Linnett, J. W. and Heath, D. F. The force fields of carbon and silicon tetrafluorides, 8090

Linnett, J. W. and Hoare, M. F. Burning velocity determination. III. Burning velocities of ethylene + air + carbon dioxide mixtures, 4826

Lintner, K. The interaction of fast neutrons with the heaviest stable nuclei (Bi, Pb, Tl and Hg), 4729

Lintner, K., Moser, H. and Cerny, C. The determination of the interaction cross-section for fast neutrons by the sphere method, 4728

Lipkin, H. J. and White, M. G. Scattering of positrons and electrons by nuclei, 374

Lippert, S. and Miller, M. M. An acoustical comfort index for aircraft noise, 6818

Lippert, W. *See* Czerny, M., 922

Lippmann, B. A. On the angular correlation theorem, 3719

Lipscomb, W. N. The structure of Millon's base and its salts, 3935. The structure of mercuric amidochloride, $\mathrm{HgNH_2Cl}$, 6591. *See also* Abrahams, S. C., 2176; Collin, R. L., 2175; Dulmage, W. J., 9151; Katz, L., 9155; Milberg, M. E., 9165

Lipson, H. Order-disorder changes in alloys, 7439. *See also* Hanson, A. W., 9142; Steeple, H., 3068; Taylor, C. A., 6579, 7385

Lipson, H. and Steeple, H. New approaches to the interpretation of X-ray powder photographs, 6573

Lipson, H. and Taylor, C. A. Optical methods in X-ray analysis. II. Fourier transforms and crystal-structure determination, 9141

Li-Shu-Hua. Cohesion and degree of polymerization of large polystyrolene molecules according to their specific heat, 4875

Liston, R. H. A. *See* Cave, J., 2025; Corner, J., 2026

Litherland, A. E. *See* Crewe, A. V., 6285

Litovitz, T. A. Ultrasonic absorption of glycerin in the liquid and vitreous state, 4190

Littauer, R. M. Random coincidence rates with unsteady sources, 393. The radioactivity of F^{20}. II, 2006. *See also* Camac, M., 6449

Littauer, R. M. and Walker, D. Production of photomesons, 6463

Little, A. G. *See* Christiansen, W. N., 5026

Little, C. G. and Maxwell, A. Fluctuations in the intensity of radio waves from galactic sources, 4956

Little, D. E. and Shrum, G. M. Correlation of auroral observations in the northern and southern hemispheres, 3999

Little, N. C. A unified approach to physics, 8490

Littler, C. L. *See* Patrick, W. A., 2129

Littler, D. J. A method of calibrating neutron sources absolutely, 8232. *See also* Colmer, F. C. W., 652, 4744

Liu, T.-K., Moe, G. and Duncan, A. B. F. The absorption spectrum of sulfur hexafluoride in the vacuum ultraviolet region, 4284

Liu, Y. H. *See* Owen, E. A., 6513

Livingston, M. S. *See* Boyer, K., 5474; Brolley, J. E., Jr, 8917

Livingston, R. The quadrupole moment ratio of Cl^{35} and Cl^{37}, from pure quadrupole spectra, 5668. The pure quadrupole spectrum of solid chlorine, 8091. *See also* Walchli, H., 5664

Livrea, G. and Campanelli, L. The behaviour of audibility thresholds at medium altitudes, 4970

Llewellyn, F. J. The X-ray photography of volatile or deliquescent single crystals, 3914. A mechanical-electrical unit for calculating structure amplitudes, 8351

Llewellyn Jones, F. *See* Jones, F. Llewellyn

Lliboutry, L. Magnetic effects of tension in weak magnetic fields, 7140

Lloyd, S. J. and Norris, D. J. A micro-indentation hardness tester for attachment to the Vickers projection microscope, 3832

Lloyd, S. P. Angular correlation: a general proof of the method of D. R. Hamilton, 1988. 2^{L-1}-magnetic 2^{L}-electric interference terms in γ–γ-angular correlations, 3747. Delayed coincidence angular correlations, 5702. Explicit γ–γ angular correlations, 8176

Loar, H. *See* Durbin, R., 8223

Lochet, R. Scattering of light (Rayleigh effect) by solutions of anisotropic ions or molecules, 239. Scattering of light by solutions of strong electrolytes; influence of the variation of the coefficient of activity with concentration, 5333. *See also* Keramsi, S., 9402

Lochte-Holtgreven, W. Experimental data on H-emission, 7480

Lock, C. *See* Packer, D. M., 7419

Lock, J. M. Penetration of magnetic fields into superconductors. III. Measurements on thin films of tin, lead and indium, 7909. *See also* Allen, W. D., 1850

Lock, J. M., Pippard, A. B. and Shoenberg, D. Superconductivity of tin isotopes, 8742

Lock, W. O. *See* Dainton, A. D., 5967; Davies, J. H., 634

Locke, J. L. *See* Crawford, M. F., 2538

Lockenvitz, E. A. *See* Hatfield, T. N. 1141

Locquin, M. *See* Dufour, C., 7779

Lodge, A. S. On the use of convected coordinate systems in the mechanics of continuous media, 8277

Loeb, A. L. A theory of the envelope type of thermal conductivity tests, 3478; Erratum, 6163. An interionic attraction theory applied to the diffuse layer around colloid particles. I, 9062. *See also* Harris, L., 8657

Loeb, L. B. Streamer breakdown and sparking thresholds, 4400. *See also* Miller, C. G., 4405, 5440, 6240

Loebenstein, W. V. and Deitz, V. R. Surface-area determination by adsorption of nitrogen from nitrogen-helium mixtures, 3875

Loevinger, R. Distribution of absorbed energy around a point source of β radiation, 1263

Loevinger, R. and Berman, M. Efficiency criteria in radioactivity counting, 9649

Lofgren, E. J. Negative ions and charge neutralization in the cyclotron, 5475

Logan, R. A. and Kusch, P. On the nuclear magnetic moment of Na^{23}, 4608

Loh, L. T. *See* Hagelbarger, D. W., 5683

Lohman, J. B., Reding, F. P. and Hornig, D. F. The fundamental vibrations and crystal structure of H_2S and D_2S, 5269

Lohmann, W. The problem of RZ Ophiuchi, 43

Loinger, A. The intensity of the external Raman and infrared lines of crystals, 2562. *See also* Giullotto, L., 8704

Lomer, P. D. The dielectric strength of aluminium oxide films, 293

Lomer, T. R. *See* Vand, V., 9164

Lonchamp, J.-P. *See* Cüer, P., 7279

Long, D. A. *See* Bell, R. P., 529

Long, E. and Meyer, L. The vapour pressure of liquid helium at the lambda-point, 8698

Long, E. A. *See also* Hulm, J. K., 294, 1818

Long, E. A. and Meyer, L. Superfluidity and thermomechanical effect in the adsorbed helium II film, 1016

Longhurst, R. S. Correction of pupil aberration in Kellner-type eyepieces, 3425. The astigmatic correction of telescopes, 7797

Longini, R. L. A high speed hot baffle for oil diffusion pump systems, 6784

Longmire, C. *See* Gamow, G., 49

Longmire, C. L. and Messiah, A. M. L. A reduction of arbitrariness in the theory of forbidden β-spectra, 8173

Longuet-Escard, J. *See* Bagno, O., 5876

Longuet-Higgins, H. C. Length of central bond in thiophthen, 2184. The statistical thermodynamics of multicomponent systems, 2427. The influence of conjugation on heterolytic dissociation energies, 6523. *See also* Burkitt, F. H., 9093; Cook, D., 9322; Price, W. C., 7749

Longuet-Higgins, H. C., Rector, C. W. and Platt, J. R. Molecular orbital calculations on porphine and tetrahydroporphine, 531

Longuet-Higgins, M. S. *See* Cooper, R. I. B., 5152

Lonsdale, K. Facts about crystals, 5910

Loofbourow, J. R. *See* Harrison, G. R., 176; Vallee, B. L., 1717

Loomis, C. C. and Strandberg, M. W. P. Microwave spectrum of phosphine, arsine and stibine, 4269

Loos, R. Study of boundary layer phenomena. Application to sapoalbin, 6063

Loosemore, W. R. *See also* Franklin, E., 4467

Loosemore, W. R. and Sharpe, J. Time-delays in low-voltage halogen-quenched Geiger–Müller counters, 6277

Lopes, J. L. Covariant canonical formalism of Maxwell's electrodynamics, 5592. On the particle picture of quantized Bose fields. I, 8499

Lopez de Azcona, J. M. Uranium in our planet, 9182. Some geophysical consequences of natural radioactivity, 9189

López de Azcona, J. M. and Camuñas Puig, A. Automatic electrical control gear for the excitation and exposure of spectra, 1719

Lopuszański, J. Solution of Thomas–Fermi equation for molecules with axial symmetry, 8087

Lord, J. J. The altitude and latitude variation in the rate of occurrence of nuclear disintegrations produced in the stratosphere by cosmic rays, 5536. *See also* Berger, M. J., 8785

Lord, J. J., Elston, A. W. and Schein, M. A large fluctuation in the rate of production of nuclear disintegrations following a solar flare, 459

Lord, J. J., Fainberg, J. and Schein, M. Evidence for the multiple production of mesons in a single nucleon-nucleon collision, 1316, 2810

Lord, J. J. and Schein, M. Diurnal variation of primary cosmic-ray heavy nuclei, 1916

Lord, M. P. Binocular eye movements at high convergence, 3244

Lord, R. C. *See also* Harrison, G. R., 176

Lord, R. C. and Nielsen, E. Apparatus for low temperature study of the Raman effect, 1756. The vibrational spectra of diborane and some of its isotopic derivatives, 4282

Lord, R. C. and Ocampo, J. The Raman spectrum of allene-d_4, 4295

Lorenz, E. *See* Pratt, A. W., 9864

Loria, A. *See* Hodson, A. L., 397

Lortie, Y. *See* Vacher, M., 2567

Los, J. M. *See also* Morrison, J. A., 1024

Los, J. M. and Morrison, J. A. The calibration of platinum resistance thermometers in the temperature range 11° to 90°K, 7821

Loshakov, L. N. Propagation of waves along a co-axial spiral line in the presence of an electron beam, 6362

Lossing, F. P. *See* Tickner, A. W., 9421

Lossnitzer, H. and Person, H. On the photometry of sky light, 4917

Lotz, J. Speech and language, 1694

Loudette, P. *See* Servant, R., 1946, 3650–1

Louisfert, J. Infra-red absorption spectra of [about 20] metallic carbonates in the powdered state, 9377

Lounsbury, M. A constant-level control for liquid nitrogen, 7819. *See also* Mathieu, J.-P., 7772

Loutfoullah, N. *See* Pauthenier, M., 1544

Loutit, J. F. Drugs for protection against atomic radiation, 6664. The tolerance of man for radioactive isotopes, 6655

Lovati, A., Mura, A., Salvini, G. and Tagliaferri, G. Cloud chamber observations on the electromagnetic component from nuclear explosions and the development of the nuclear cascade, 2806

Lovati, A., Mura, A., Succi, C. and Tagliaferri, G. Interaction mean free path of the particles emitted in cosmic ray nuclear explosions, 5541

Lovati, A., Mura, A., Tagliaferri, G. and Terra, L. A large Wilson [cloud] chamber for research on cosmic radiation, 9557

Love, S. K. Natural radioactivity of water, 9647

Lovtsov, V. M. *See* Arifov, U., 3878

Low, F. *See also* Brueckner, K. A., 7533

Low, F. E. and Salpeter, E. E. On the hyperfine structure of hydrogen and deuterium, 7679

Low, W. and Townes, C. H. Evidence from nuclear masses on proposed closed shells at 20 nucleons, 1970

Lowde, R. D. The design of neutron counters using multiple detecting layers, 1333. Single crystal neutron diffraction analysis, 3947

Löwdin, P.-O. A note on the method of steepest descents with a remark on T. Ljunggren's paper "Contributions to the theory of diffractions of electromagnetic waves by spherical particles," 1943. *See also* Lundqvist, S. O., 7148

Löwdin, P.-O. and Sjölander, A. A note on the numerical calculation of asymptotic phases with a numerical study of Hulthén's variational principle, 6743

Lowes, F. J. and Runcorn, S. K. The analysis of the geomagnetic secular variation, 7399

Loya, M. V. Line width in the Raman rotatory molecular spectra and "width" of Rayleigh line, 6137

Lozé, C. de. *See* de Lozé, C.

Lu, H.-C. On the surface of discontinuity between two flows perpendicular to each other, 2444

Lubman, N. M. *See* Kusakov, M. M., 2422

Lubny-Gertsyk, A. Atomic radiation acting in fissure between reflecting planes, 1607

Lucas, D. H. *See* Yates, J. G., 861, 4127

Luce, R. G. and Trischka, J. W. Molecular constants of $Cs^{133}Cl^{35}$, 8642

Luce, W. M., Quastler, H. and Lanzl, E. F. Biological evaluation of 20 million volt roentgen rays. V. Bar effect in *Drosophila*, 3246

Luchak, G. On a generalization of Wilson's hypothesis, 9258

Luchak, G. and Langstroth, G. O. Applications of diffusion theory to evaporation from droplets and flat surfaces, 2610

Lucht, C. M. *See also* Kasper, J. S., 1500

Lucht, C. M. and Harker, D. An X-ray microscope using mirrors of adjustable curvature, 7002

Luck, C. P. A membrane manometer with secondary air transmission, 6053

Luck, W. Studies of the visible absorption band of iodine vapour, 7692. The validity of the Lambert–Beer law, 7695. *See also* Kortüm, G., 6125, 7691

Lucke, W. S. Electric dipoles in the presence of elliptic and circular cylinders, 2858

Luckey, G. W. and Noyes, W. A., Jr. The fluorescence of acetone vapor, 4291

Lüders, G. On the effect of electric fields on the lifetime of the metastable states of hydrogen, 3710. Changes of state caused by the process of measurement, 6020. The Stark effect in hydrogen at low field-strengths, 6104

Ludlam, F. H. Structure of shower clouds, 4937. The production of showers by the coalescence of cloud droplets, 9214. *See also* Mason, B. J., 7417

Ludwig, G. Formulation of a divergence-free quantum-electrodynamics, 4086

Ludwig, G. D. The velocity of sound through tissues and the acoustic impedance of tissues, 1677. *See also* Ballantine, H. T., Jr, 2266

Ludwig, R. *See* Euler, J., 1022

Lufcy, C. W., Palubinskas, F. S. and Maxwell, L. R. Electron diffraction by transmission through thin liquid films, 4590

Lu, Hoff. *See* Hoff Lu

Lukashenya, V. T. and Krasovskiĭ, V. I. Details of the night-sky spectrum between 9 500 and 1 200 Å, 9853

Luke, P. J. *See also* Meyerott, R. E., 8534

Luke, P. J., Meyerott, R. E. and Clendenin, W. W. Wave function of ionized lithium, 8903

Lukesh, J. S. On the symmetry of graphite, 1498. The unit cell and space group of ammonium metavanadate, NH_4VO_3, 1503. On the possible identity of rhombohedral and orthorhombic graphite, 4899. *See also* Seybolt, A. U., 8354

Lukshin, A. A. and Shur, Ya. S. Dependence of the effect of thermomagnetic treatment on the initial characteristics of a ferromagnetic, 9592

Lumbroso, H. Current theories of the ferro-electric state, 6942

Lumpkin, H. E. *See* Franklin, J. L., 8882

Lun, M. J. *See* Farnsworth, H. E., 2754

Lunbeck, R. J. *See also* Michels, A., 8574

Lunbeck, R. J. and Boerboom, A. J. H. On the second virial coefficient of gas mixtures, 4172

Lunbeck, R. J. and ten Seldam, C. A. On the second and third virial coefficient of methyl fluoride, 9338

Lund, L. H. *See* Choate, R. L., 8557; Kerr, R. H., 4151

Lundby, A. Scintillation decay times, 2571. Delayed coincidence circuit for scintillation counters, 5500. The interpretation of metastable nuclear energy-levels, 4592. The influence of the time lag fluctuations in Geiger counters on delayed coincidence measurements, 6273

Lundby, A. and Marshall, L. Photoproton emission, 7275

Lundgren, G. The crystal structure of $Th(OH)_2SO_4$, 2181

Lundquist, B. *See* Ekelöf, S., 1567

Lundquist, G. *See* Wegener, P., 3490, 7616

Lundquist, S. Magneto-hydrostatic fields, 1942. On the stability of magneto-hydrostatic fields, 7109

Lundqvist, S. O. and Fröman, P. O. Some remarks on the calculation of the cohesive energy of ionic crystals, 1959

Lundqvist, S. O. and Löwdin, P.-O. On the calculation of certain integrals occurring in the theory of molecules, especially three-centre and four-centre integrals, 7148

Luneburg, R. K. The metric of binocular visual space, 2254

Lunelund, H. and Nordström, S. On radiation of the sky in Finland, 3982

Lure, B. *See* Murin, A., 3062, 6451

Lurie, B. *See* Lure, B.

Lusby, W. S. The intensification of X-ray fluorescent images, 5960

Lüscher, E., Ricamo, R., Scherrer, P. and Zünti, W. The energy dependence of the processes $S^{32}(n, p)P^{32}$ and $P^{31}(n, p)Si^{31}$, 621

Luther, H. Results and problems concerning the vibration spectrum of naphthalene, 1222

Luthra, S. P. *See* Barnard, A. J., 9758

Luttinger, J. M. A note on Tisza's theory of superconductivity, 1848. A note on the ground state in antiferromagnetics, 5554. Wave propagation in one-dimensional structures, 8871. *See also* Jost, R., 1295

Luttringhaus, H. *See* Davidson, H. R., 8667

Lutz, A., Chapelle, J. and Delannoy, N. Elastic compliances of ammonium arsenate, 2157

Lützow, J. *See* Haul, R., 2423

Luzzati, V. Crystal structure of anhydrous nitric acid, 3931. Crystal structure of nitric acid with three water molecules, 5926. Crystal structure of $HNO_3 . H_2O$, 6590. Crystal structure of piaselenole, piazthole and benzofurazane, 6596. On the convergence and the error in non-centrosymmetric structures, 9138

Lyand, R. *See* Jaffray, J., 8705

Lyashenko, M. N. *See* Shepelev, A. I., 3187

Lyashenko, V. I. and Pavlenko, A. M. Dependence of the contact resistance between metal and semiconductor on the contact p.d., 1838

Lykins, J. H. *See* Macklin, R. L., 7284

Lyn, W. T. *See* Egerton, A., 3495

Lynch, A. C. The variation with temperature of the piezoelectric coefficients of quartz, 1046

Lynton, E. A. and Fairbank, H. A. The velocity of second sound in mixtures of He^3 and He^4, 265. Second sound in He^3–He^4 mixtures, 2630

Lyon, D. N. and Geballe, T. H. The temperature coefficient of resistance of tin-oxide-coated electrically conducting glass between 1° and 300°K, 305

Lyon, L. *See* Selwood, P. W., 1403

Lyon, W. S. Radioactive Hg^{203} and Hg^{205}, 5694

Lyons, D. The diffusion of thermal neutrons. (Exact theory taking account of the anisotropy of single scattering), 4759

Lyons, H. *See also* Birnbaum, G., 2664; Rueger, L. J., 6867

Lyons, H., Rueger, L. J., Nuckolls, R. G. and Kessler, M. Microwave spectra of deutero-ammonias, 4268

Lyot, B. A new method of observing the solar corona, 36

Lysgaard, L. On the present climatic variation, 4944

Lysons, H. The use of polytetrafluoroethylene insulators in integrating ion chambers, 1882

Lyubarskiĭ, G. L. *See* Akhiezer, A. I., 376

Lyubimov, A. L. *See* Podgoretskiĭ, M. I., 2787

Ma, S. T. Quantum theory of the longitudinal electromagnetic field, 1603. Retarded nuclear interaction, 4097

Mabboux, C. Discussion of a particular method of measuring the multiple scattering of high-energy particles in a photographic emulsion, 5733. Discussion of a measurement of multiple Coulomb scatter, 7953

MacAdam, D. L. Loci of constant hue and brightness determined with various surrounding colors, 1000. Quality of color reproduction, 6905. Influence of visual adaptation on loci of constant hue and saturation, 9868

McAfee, K. B., Ryder, E. J., Shockley, W. and Sparks, M. Observations of Zener current in germanium *p–n* junctions, 7897

McAfee, K. B., Jr. Microwave spectrum of NO_2, 6866

McAlister, J. M. and Keam, D. W. Factors involved in the accuracy and reproducibility of depth measurements on nuclear research emulsions, 2282

MacArthur, I. Some factors in precision monochromatization and collimation, 2722. Temperature-variation of structures in homologous series, 2722. *See also* De Barr, A. E., 2722

Macaulay, J. M. Adsorption of water vapour on solid surfaces, 7355

McAuliffe, D. R. *See* Davis, H., 4204, 8396

McAuslan, J. *See* Tetlow, K. S., 6103

McBain, J. W. *See* Brady, A. P., 6170

McCaa, D. G. *See* Prichard, A. C., 1824

McCaig, M. *See* Hoselitz, K., 2831, 8042

McCall, D. W. *See* Gutowsky, H. S., 6066

McCallum, K. J. and Holmes, O. G. Chemical effects of the $Cl^{35}(\gamma, n)Cl^{34}$ reaction in sodium chlorate, 9776

McCammon, G. *See* Roberts, L. D., 1326

McCarthy, K. A. *See* Ballard, S. S., 2599; Combes, L. S., 4229

McCarthy, W. A. *See* Krohmer, J. S., 5719

McCay, H. A. C. The Szilard–Chalmers process, 9778

McClanahan, E. D., Jr. *See* Waser, J., 4910

McClellan, A. L. and Hackerman, N. The sorption of gases on metals at room temperature, 6541

McClellan, A. L. and Pimentel, G. C. A simplified percent transmission computer, 4034

McClure, B. T. *See* Johnson, R. A., 1865

McClure, D. S. Excited triplet states of some polyatomic molecules. I, 6119

McClure, G. W. and Pomerantz, M. A. Ionization chamber bursts at very high altitudes, 457. *See* Groetzinger, G., 5737

McClure, R. E. *See* Gutowsky, H. S., 4601, 4605

Maccoll, A. and Thomas, P. T. The pyrolysis of *iso*propyl bromide, 7357

McConnell, J. Diverging integrals in the self-charge problem, 4084

MacCormack, K. E. and Schneider, W. G. Compressibility of gases at high temperatures. IV. Carbon dioxide in the temperature range 0°–600°c, and pressures up to 50 atmospheres, 127. Thermodynamic properties of gaseous carbon dioxide at temperatures from 0°–600°c, and pressures up to 50 atmospheres, 279. Intermolecular potentials. I. Carbon tetrafluoride and sulfur hexafluoride; II. Carbon dioxide, 6789. Compressibility of gases at pressures up to 50 atmospheres. V. Carbon tetrafluoride in the temperature range 0°–400°c; VI. Sulfur hexafluoride in the temperature range 0°–250°c, 7608

McCormick, W. W. *See* Hoyt, G. D., 1789

McCoubrey, A. O. *See* Alpert, D., 7583

McCrea, J. M. Intramolecular isotopic fractionation—the example of nitrous oxide, 4624. *See also* McKinney, C. R., 562

McCrea, W. H. Quantum mechanics and astrophysics, 1568. Relativity theory and the creation of matter, 5010. The clock paradox in relativity theory, 6018. *See also* Gilloch, J. M., 1596

McCready, L. L. *See* Wild, J. P., 2328

McCubbin, T. K., Jr, and Sinton, W. M. Recent investigations in the far infra-red, 190

McCue, J. J. G. *See* Roseborough, W. D., 8965

McCusker, C. B. A. Penetrating particles in air showers, 1160. *See also* Janossy, L., 425

McCusker, C. B. A. and Millar, D. D. A note on the V-particle, 7056

McDaniel, B. D. *See also* Stearns, M. B., 6454

McDaniel, B. D., Walker, R. L. and Stearns, M. B. Neutron yields from photo-disintegration by gamma-rays from lithium, 3020

MacDonald, D. K. C. Transit-time phenomena in electron streams, 362. The velocity Brownian movement, 3344. Transit-time phenomena in electron streams. III. The electron-ion plasma and beam fluctuations, 6257. Metallic conduction—the "internal size-effect," 7850

MacDonald, D. K. C. and Templeton, I. M. The resistance-minimum in gold, 5418

McDonald, H. J., Urbin, M. C. and Williamson, M. B. Ionography: some aspects of ion migration on paper in an electric field, 9105

MacDonald, J. C. F. *See* Crawford, M. F., 2538

MacDonald, J. J. and Wetmore, F. E. W. A test of the diffusion term in the Ilkovic equation, 9111

MacDonald, J. K. L. *See* Evans, G. W., II, 5346

MacDonald, J. R. *See* Griffiths, J. H. E., 2818

MacDonald, T. H. *See* Fritz, S., 9211

McDonnell, F. R. M., Pink, R. C. and Ubbelohde, A. R. Some physical properties associated with "aromatic" electrons. III. The pseudo-metallic properties of potassium-graphite and graphite-bromine, 3879

Macek, O. and Kruis, A. Stray light characteristics of photographic objectives, 1005

McElhinney, J. *See also* Ogle, W. E., 4720

McElhinney, J. and Ogle, W. E. Relative photo-fission cross sections of several fissionable materials, 4719

McEwan, W. S. and Skolnik, S. An analog computer for flame gas composition, 4339

McFarland, R. H. On low energy X-ray absorption by nuclei, 8978. *See also* Phillips, B. B., 4266

McFarlane, A. B. *See* Lempicki, A., 7019

MacFarlane, G. G. A theory of contact noise in semiconductors, 314

McGannon, J. *See* Heller, R. B., 1502

MacGillavry, C. H. *See also* Pepinsky, R., 7388; Romers, C., 3930

MacGillavry, D., Singer, J. J., Jr and Rosenbaum, J. H. Metal-solution potentials of nickel in foreign ion solutions, 9113

McGinnis, C. L. Radioactivity of Ag^{111}, Cd^{111}, Id^{111}, and Sn^{111}, 4652; Erratum, 8163. The isomeric level of Cd^{111m}, 8921

McGinnis, C. S., Elnick, M. and Kraichman, M. A study of the vowel formants of well-known male operatic singers, 6817

McGlashan, M. L. *See* Guggenheim, E. A., 282, 5132, 5172

McGlone, P. *See* Arden, T. V., 191

McGowan, F. K. A 3×10^{-9} sec. isomeric state in $_{63}$Eu^{153}, 1999. A $1{\cdot}7\times10^{-9}$-sec. isomeric state in $_{68}$Er^{166}, 2956. An 8×10^{-10}-sec isomeric state in $_{76}$Os^{186}, 6403

McHaney, G. M. *See* Fireman, E. L., 1886

Machin, K. E. Distribution of radiation across the solar disk at a frequency of 81·5 Mc/s, 6691. *See also* Ramsey, J. A., 3423

Macinante, J. A. *See* Bruce, C. F., 6080

MacInnes, D. A., Dayhoff, M. O. and Ray, B. R. A magnetic float method for determining the densities of solutions, 8544

McIntosh, D. H. Geomagnetic "sudden commencements" at Lerwick, 6616. Geomagnetic effects of solar flares, 8369

McIntosh, R., Rideal, E. K. and Snelgrove, J. A. The dielectric behaviour of vapours adsorbed on activated silica gel, 8312

McIntyre, J. A. *See* Hofstadter, R., 2020–1, 6481

MacIntyre, W. J. Measurements of short-lived isomers, 2957

Mack, C. The capacitance of a parallel-plate condenser with an anisotropic dielectric cylinder in torsion between its plates, 5384

Mack, J. E., Murakawa, K., Ross, J. S., Pick, F. A. and van den Bosch, J. C. On the structure of Te ii, 8141

Mack, R. A. *See* Davenport, L. L., 8781

Mackay, A. L. Spherical Patterson sections, 9828

McKay, C. D. *See* Scheidegger, A. E., 6732, 9266

McKay, H. A. C. *See* Glueckauf, E., 1457

McKay, K. G. A pulse method of determining the energy distribution of secondary electrons from insulators, 2755

Mackay, R. W. *See* Landsberg, P. T., 6214

McKay, W. B. *See* Quinn, H. F., 1776

McKeag, A. H. *See* Jenkins, H. G., 1751

McKean, D. C. *See* Callomon, H. J., 7751, 7753

McKee, S. A. and White, H. S. The McKee worker-consistometer, with constant-speed drives, 3870

McKeehan, L. W. Ferromagnetic block, 499. Physical theory of ferromagnetic domains, 500. *See also* Kouvelites, J. S., 4567

McKellar, A. The atmospheres of the late-type stars, 5050

McKellar, A. and Tawde, N. R. Calculated transition probabilities for the C_2 Swan bands, 6111

McKenzie, C. D. *See* Collins, E. R., 6453; Law, P. G., 446

Mackenzie, J. K. The stresses and energies associated with intercrystalline boundaries, 2107. *See also* Boas, W., 7439

MacKenzie, K. R. The proton deuteron rf system for the Berkeley synchrocyclotron, 5476. *See also* Fox, R., 1329

McKeown, M. *See* Scharff-Goldhaber, G., 6435, 8919

McKeown, P. J. A., Ubbelohde, A. R. and Woodward, I. Thermal expansion of *p*-nitroaniline and *p*-dinitrobenzene, 8685

McKinley, B. M. and McKinley, D. W. R. Photoelectric meteor observations, 8441

McKinley, D. W. R. Deceleration and ionizing efficiency of radar meteors, 2324. Meteor velocities determined by radio observations, 5018. *See also* McKinley, B. M., 8441; Millman, P. M., 5986

McKinney, C. D., Jr and Kilpatrick, M. An apparatus for measuring the rates of some rapid reactions, 9052

McKinney, C. M. *See* Horton, C. W., 1197

McKinney, C. R., McCrea, J. M., Epstein, S., Allen, H. A. and Urey, H. C. Improvements in mass spectrometers for the measurement of small differences in isotope abundance ratios, 562

Mackle, H. *See also* Allen, P. W., 5463

Mackle, H. and Sutton, L. E. A study of the stereochemistry of acraldehyde and crotonaldehyde by the electron diffraction method, 9096

Macklin, R. L. and Lykins, J. H. Photoneutron fission analysis for U-235 in high purity U-238, 7284

MacKnight, M. L. and Chasson, R. L. Construction of the external-cathode Geiger counter, 9548

Mackor, E. L. The properties of the electrical double layer. I. Thermodynamics of the double layer on silver iodide and mercury, 9072

McLachlan, D., Jr. The determination of crystal structures from X-ray data without a knowledge of the phases of the Fourier coefficients, 5917 *See also* Howell, B., 9826; Shimizu, H., 1496

McLachlan, D., Jr and Woolley, R. H. A multiple projector for the Huggins masks, 7389

McLauchlan, T. A., Sennett, R. S. and Scott, G. D. Continuous observations with the electron microscope on the formation of evaporated films of silver, gold, and tin, 1349

McLennan, D. E. Study of ionic crystals under electron bombardment, 8253

McLucas, J. L. and Raymond, R. C. The power spectrum of a narrow band noise passed through a non-linear impedance element, 9459

McMahon, A. J., Rossi, B. and Burditt, W. F. Altitude and latitude dependence of bursts in a lead-shielded ionization chamber, 1167

McMahon, H. O. *See* Šimon, I., 3107, 6519

McMillan, E. M. The relation between phase stability and first-order focusing in linear accelerators, 1872. A thick target for synchrotrons and betatrons, 4778

McMillan, E. M., Blocker, W. and Kenney, R. W. The *r*-unit at 320 and 160 MeV, 4630

McMillan, W. G. and Teller, E. The role of surface tension in multilayer gas adsorption, 4862. The assumptions of the B.E.T. theory, 6539

McMillen, J. H., Kramer, R. L. and Allmand, D. E. Shadowgrams of spherical missiles entering water at supersonic speeds, 872. Impact flash at high speed water entry, 3353

McMullen, A. I. *See* Cockbain, E. G., 9083

McMurry, H. L. *See also* Condon, F. E., 7710; Rollman, H. W., 7368

McMurry, H. L. and Thornton, V. The infra-red spectra of propane and 2,2-dideuteropropane, 2539. The infrared spectra of propane and its symmetrical deuterium substituted analogs, 7711

McNally, J. R., Jr *See* Smith, D. D., 3434; Werner, G. K., 8621

Macnamara, J. and Thode, H. G. The relative neutron capture cross-sections of the isotopes of krypton and xenon, 2049. The isotopes of xenon and krypton in pitchblende and the spontaneous fission of U^{238}, 3027

McNary, B. D. The enhanced photoelectric emission effect in barium oxide, 4390

Macnee, A. B. An electronic differential analyser, 4033

McNeill, K. G. and Keyser, G. M. The relative probabilities and absolute cross sections of the D–D reactions, 4715

McNeill, K. G. and Rall, W. The possibility of the reaction H^3(d, p)H^4, 9701

McNown, J. S. and Hsu, E.-Y. Approximation of axisymmetric body forms for specified pressure distributions, 6773

McPherson, J. C. *See* Millsaps, K., 4176

McQueen, J. H. Isotopic separation due to settling in the atmosphere, 1259

McQuillan, A. D. An experimental and thermodynamic investigation of the hydrogen-titanium system, 2115

McReynolds, A. W. Gravitational acceleration of neutrons, 7299

McReynolds, A. W. and Weiss, R. J. Coherent neutron scattering cross-section of V^{51}, 7297

McRonald, A. D. *See* Landsberg, P. T., 6214

McSkimin, H. J. A method for determining the propagation constants of plastics at ultrasonic frequencies, 6803. *See also* Bond, W. L., 6956

McVittie, G. C. The expansion of an interstellar gas-cloud into a vacuum, 2314. Two-colour indices and general relativity, 9247

McWeeny, R. The diamagnetic anistropy of large aromatic systems. I–II, 3641

McWhirter, J. W. *See* Alers, P. B., 9485

Madansky, L. and Rasetti, F. Continuous γ-radiation of β-emitters, 7245

Maddams, W. F. and Schnurmann, R. Ultraviolet absorption spectrum of fluoranthene, 6862

Maddin, R. and Asher, W. R. Apparatus for cutting metals strain-free, 1553

Madella, G. B. The acoustic coupling between the diaphragms of two coaxial loudspeaker units, 3412

Madelung, O. The angular distribution of the secondary electrons of the hard component of cosmic rays, 3617

Madigan, J. R. and Cleveland, F. F. Substituted methanes. V. Infrared spectra and calculated thermodynamic properties for some trichloromethanes, 4262

Madsen, B. S. *See* Brostrøm, K. J., 9692

Madsen, C. B. *See* Brostrøm, K. J., 9692

Maecker, H. Checking the theory of arcs: the effective molecular cross-section for air at high temperatures, 339. An arc discharge with high loading, 4408. *See also* Burhorn, F., 6236

Maeda, S. On the magnetic after effect due to the irreversible displacement of domain boundary. I, 1939; II. The dependence on temperature and tension, 5591

Maeder, D. An aspherical objective of high light grasp for cathode-ray oscillography, 932. *See also* Medicus, H., 4642

Maehly, H. J. On the approximate calculation of eigenvalues of a Schrödinger equation, 9284

Maesen, F. van der. *See* van der Maesen, F.

Magat, M. and Bruma, M. On a resonator for metre and decimetre waves, 8055

Magazanik, A. A. *See* Gvozdover, S. D., 7085

Magdoff, B. S. The crystal structure of p- di-tertiary-butylbenzene, 3944. Forbidden reflections in the Harker–Kasper inequalities, 6577

Magee, J. L. Theory of radiation chemistry. I. Some effects of variation in ionization density, 9071

Magee, J. L. and Burton, M. Elementary processes in radiation chemistry. II. Negative ion formation by electron capture in neutral molecules, 5874

Magill, P. L. *See* Cadle, R. D., 9078

Magnéli, A. Diffraction effects in X-ray Fourier syntheses due to non-observed weak reflexions, 9140

Magnus, W. and Oberhettinger, F. On systems of linear equations in the theory of guided waves, 7121

Magnuson, D. W. Determination of the two-dipole moment components in nitrosyl fluoride, 8885

Magnusson, L. B. A method of isotopic separation by (n, γ) recoil, 4625 *See also* Huizenga, J. R., 1277, 6462, 9046

Mahan, A. I. and Price, E. E. Diffraction pattern deterioration by roof prisms, 1769

Mahl, H. *See* Kling, W., 3808

Maienschein, F. C. *See also* Bair, J. K., 4671, 4680, 6440, 9673

Maienschein, F. C., Bair, J. K. and Baker, W. B. Gamma-radiation from I^{132}, 8941

Maier-Leibnitz, H. Report on recent experimental work on the physics of very fast particles, 4689. *See also* Ritter, O., 7939

Maĭorov, F. V. Electrical representation of functions, 2300

Mair, W. A. *See* Bardsley, O., 2451

Mair, W. N. *See* Carpenter, L. G., 3484

Maitra, J. C. *See* Banerjee, K., 9824

Maitrot, M. Photophoresis of particles of coloured fog. Speed as a function of concentration of disperse solutions and of particle size, 5223. *See also* Thibaud, J., 921

Major, J. K. *See also* Dreyfus, B., 4684

Major, J. K. and Süe, P. Separation of radiochlorine by the Szilard–Chalmers effect, 3758

Majorana, Q. Cohesion, nuclear forces and Newton's law, 1626

Majumdar, S. D. The theory of the separation of isotopes by thermal diffusion, 4626

Majumdar, S. D. and Chowdhury, D. C. Wave function for the groundstate of lithium, 1985

Majumdar, S. K., Bandyopadhyay, G. and Datta, S. Electrical conductivity of borax glasses containing dispersed gold, 2679

Majury, T. G. *See also* Burrell, C. M., 3509

Majury, T. G. and Melville, H. W. A dielectric constant method of following the non-stationary state in polymerization. II. The operation and performance of the instrument, 3510; III. The determination of rates of polymerization and of radical lifetimes, 3511

Makin, M. J. *See* Andrade, E. N. Da C., 2112

Makinson, R. E. B. and Buckingham, M. J. The second order photoelectric effect at a metal surface, 2695

Makinson, R. E. B., Thonemann, P. C., King, R. B., Ramsay, J. V. Dielectric constant and electron density in a gas discharge, 7912

Makishima, S., Koana, Z. and Oshima, K. A new constant-deviation prism arrangement, 4226

Makita, Y. and Miyatani, S. The time in which equilibrium state of audition is established. III. A new method of measuring the damping constant of the mechanical systems of the ear, 2260

Malaker, S. F. Investigation of nuclear effects in paramagnetic single crystals at very low temperatures, 9602

Malamand, F. Spectrographic analysis of metallic layers obtained by thermal diffusion of Cr in iron and steel, 3064

Malan, D. J. High-efficiency apparatus for lightning chronophotography, 765. *See also* Clarence, N. D., 7421; Schonland, B. F. J., 9855

Malan, D. J. and Schonland, B. F. J. The electrical processes in the intervals between the strokes of a lightning discharge, 5432. The distribution of electricity in thunderclouds, 9856

Malcolm, I. and Strachan, C. Relativistic wave-functions and *K*-capture for a modified Coulomb field, 9283

Maletskos, C. J. *See also* Brownell, G. L., 3725

Maletskos, C. J., Backofen, E. W. and Irvine, J. W., Jr. Preparation of Zn^{65} of high specific activity from copper bombarded with 16-Mev deutrons, 6443

Malevergne, A. *See* de Mallemann, R., 5619, 8072

Malkus, W. V. R. The interaction of the Dirac magnetic monopole with matter, 8516

Malleman, R. de. *See* de Malleman, R.

Mallinckrodt, A. J. *See* Helliwell, R. A., 6634

Malm, R. and Buechner, W. W. Proton groups from the $N^{14}(d, p)N^{15}$ and $N^{15}(d, p)N^{16}$ reactions, 3010. Alpha-particle groups from the $N^{14}(d, \alpha)C^{12}$ and $N^{15}(d, \alpha)C^{13}$ reactions, 4714

Malmberg, C. G. and Maryott, A. A. Dielectric constants of aqueous solutions of dextrose and sucrose, 2665

Malmstrom, C., Keen, R. and Green, L., Jr. Some mechanical properties of graphite at elevated temperatures, 5833

Malpica, J. M. Electrostatic direct-current transformer of 300 kilovolts, 6940

Malsch, J. The electron and electrical conduction in solids, 1826

Malter, L. *See also* Johnson, E. O., 1078

Malter, L. and Webster, W. M. Rapid determination of gas discharge constants from probe data, 8754

Malvano, R. *See* Kip, A. F., 9599

Malvern, L. E. The propagation of longitudinal waves of plastic deformation in a bar of material exhibiting a strain-rate effect, 7322

Malyshev, G. M. *See* Kagan, Yu. M., 3540

Malyuzhinets, G. D. Mathematical formulation of the problems of enforced harmonic oscillations in an arbitrary domain, 8587. Focusing in an absorbing medium, 9357

Mamasakhlisov, V. I. Scattering of light by a bound electron with due regard to retardation, 8148

Manacorda, T. On the discontinuity in the derivatives of gravitational potential at a surface of discontinuity of density, 6047

Mande, C. *See* Deodhar, G. B., 4413

Mandel, J. The consolidation of soil, 3066

Mandelbrot, B. The adaptation of a message to the transmission channel. I. Information quanta. II. Physical interpretations, 8429

Mandelkern, L. and Flory, P. J. The dependence of the diffusion coefficient on concentration in dilute polymer, 7602

Mandelev, B. G. and Svyatoezerskaya, L. A. Deionization of Hg vapours at low pressures in a strong electric field, 6289

Mandeville, C. E. *See also* Albrecht, H. O., 3589; Gill, P. S., 1993, 6408; Swann, C. P , 612

Mandeville, C. E. and Albrecht, H. O. Detection of scintillations from crystals with a photo-sensitive Geiger–Müller counter, 1128. Detection of beta-induced scintillations from crystals with a photosensitive Geiger–Mueller counter, 1129. Crystals and Geiger counters for scintillation counting, 1883. The detection of gamma-ray-induced scintillations from crystals in a photo-sensitive Geiger–Müller counter, 1884

Mandeville, C. E. and Scherb, M. V. Photosensitive Geiger counters: their applications, 3582

Mandeville, C. E. and Shapiro, E. Gamma-rays emitted in the disintegration of the 36-hour Rh^{105}, 7242. Coincidence studies of the disintegration of neodymium (147), cerium (144), praseodymium (144) and cerium (143), 8170

Mandeville, C. E. and Swann, C. P. The neutrons from the disintegration of C^{13} by deuterons, 614

Mandl, F. *See* Flower, B. H., 3769

Mandleberg, C. J. *See* Dawson, J. K., 8845

Manduchi, C. *See* Bassi, P., 8815

Manecke, G. Conductivity of organic salts, 9466

Manes, M., Hofer, L. J. E. and Weller, S. Classical thermodynamics and reaction rates close to equilibrium, 1395

Manfredini, A. On the angular distribution of the prongs of stars produced by cosmic rays in photographic emulsions, 3619. *See also* Bernardini, G., 469–70

Maniwa, H. *See* Sawaguchi, E., 9835

Mann, A. K. *See also* Halpern, J., 7277

Mann, A. K. and Halpern, J. Excitation function of the reaction $C^{12}(\gamma, p)B^{11}$, 3018. Yields of photo-protons from twenty elements, 5778

Mann, J. G. *See* Tramp, J. G., 1083

Mann, L. G. and Axel, P. Decay of Y^{87} and Sr^{87m}, 2960

Manning, L. A., Villard, O. G., Jr and Peterson, A. M. Meteoric echo study of upper atmosphere winds, 763

Manning, W. M. *See* Ghiorso, A., 6404

Mano, K. *See* Hayakawa, S., 452, 5539

Manoĭlov, S. E. *See* Brumberg, E. M., 3185

Manov, G. G. and Curtiss, L. F. The half-life of carbon 14, 5692

Mansfield, W. O., Jr, Fuhrmeister, J. C. and Fry, D. L. Spectrographic determination of halogens and sulfur in engine deposits, 6556

Many, A. An improved electrical network for determining the eigenvalues and eigenvectors of a real symmetric matrix, 4038

Maple, E. *See also* Singer, S. F., 8370

Maple, E., Bowen, W. A., Jr and Singer, S. F. Evidence for ionosphere currents from rocket experiments near the geomagnetic equator, 7398

Mapother, D., Crooks, H. N. and Maurer, R. Self-diffusion of sodium in sodium chloride and sodium bromide, 658

Marais, E. J. and Verleger, H. Rotational structure of the ultraviolet band system of the P_2 molecule, 1727

Marakawa, K. *See* Mack, J. E., 8141

Marandon, J. The crystalline lens and its reaction in different subjects treated by various mydriatics, 770, 2255*

Marchand, A. Study of the Raman triplet of ammonia at 3300 cm^{-1}, 4299

Marchand, N. *See* Briller, S. A., 1549

Marco, A. De. *See* De Marco, A.

Marcuvitz, N. and Schwinger, J. On the representation of the electric and magnetic fields produced by currents and discontinuities in wave guides, 6365

Mardles, E. W. J. The rheology of lubricant films, 3848. *See also* Bielak, E. B., 3849

Mardles, E. W. J., Bielak, E. and Tingle, E. The spreading behaviour and lubricating properties of mixed liquids, 866

Mardles, E. W. J. and de Waele, A. Some aspects of the rheology and the stability of emulsions and suspensions, 9075

Maréchal, A. *See also* Camus, A.-M., 5324; Dossier, B., 5326

Maréchal, A. and Dejonc, P. Some aspects of Twyman fringes, 230

Maréchal, A. and Naudin, F. An experiment on the boundary effect, 4311

Maréchal, M. *See* Dossier, B., 7783

Maret, G. *See* Cañac, A., 1861

MARGARIT, A. New method of measuring the modulus of elasticity and the possibility of using it on concrete, 672

MARGEM, N. *See* PESSOA, E. F., 6471

MARGENAU, H. Conceptual foundations of the quantum theory, 4080. Statistical theory of pressure broadening, 4244. *See also* ADLER, F. P., 349

MARGOLOFF, R. *See* BONNE, R., 6265

MARIANI, F. A nomographic representation of the collision between two particles of automic dimensions, 9281. *See also* AMALDI, E., 640, 839

MARÍN, A. *See* RÍUS, A., 1427

MARINER, T. *See* BOENNING, C. B., 4191

MARKLAND, E. The deflection of a cable due to a single point load, 9289

MARKOV, M. On the meson effect in deuterium, 3787

MARKOV, M. A. On fields that cannot be localized. I, 8531

MARKOVITZ, H. Note on "interference" of growing spherical precipitate particles, 655

MARKS, E. K. *See* JACOBSON, L. O, 7433

MARKUS, A. M. *See* KORSUNSKIĬ, M. I., 8996

MARKUS, A. M., PIVOVAR, L. I. and PODGORNYĬ, I. M. An indicator for molecular beams, 8997

MARMIER, P. *See* BLASER, J.-P., 2939, 3763, 9665

MARONI, P. *See* FALLOT, M., 6341

MARQUEZ, L. A model for photo-nuclear reactions, 4725

MARQUEZ, L. and PERLMAN, I. Observations on lithium and beryllium nuclei ejected from heavy nuclei by high energy particles, 5747

MARSCHALL, H. The theory of the anomalous scattering of α-particles by spinless nuclei, 2965

MARSCHALL, H. and WISKOTT, D. The line-form of the resonance scattering of α-particles, 8164

MARSHAK, R. *See* ASHKIN, J., 5795

MARSHAK, R. E. *See also* SEIDEL, W., 3797; TAMOR, S., 3042

MARSHAK, R. E., TAMOR, S. and WIGHTMAN, A. S. Further remarks on the absorption of π^{-}-mesons in hydrogen, 3041

MARSHALL, B. O., JR. An analogue multiplier, 2297

MARSHALL, D. G. *See* BULL, T. H., 5513

MARSHALL, J. Čerenkov radiation counter for fast electrons, 4426

MARSHALL, J. L. *See* BERANEK, L. L., 5219

MARSHALL, L. Properties of (γ, n) cross sections, 7276. *See also* LUNDBY, A., 7275

MARSHALL, L., ROSENFELD, A. H. and WRIGHT, S. C. Nuclear gamma-absorption cross section of Cu^{63}, 7274

MARTEL, M.-T. Polarization of the diffused light of N.G.C. 7023, 7481

MARTELL, A. E. *See* STERN, K. H., 9441

MARTELL, E. A. and LIBBY, W. F. The natural radioactivity of In^{115}, 2945

MARTELLI, G. *See* BALLARIO, C., 8008, 9575

MARTIN, A. E. Calibration of infrared spectrometers, 4239

MARTIN, A. E., VOGEL, R. Q. and HARJES, F. W. Contrast measurement in TV images, 7655

MARTIN, C. Statistical study of β-emitting isotopes, 1283. On linear property common to all α-emitting elements of the natural families, 2964

MARTIN, D. F. The theory of magnetic storms and auroras, 8371

MARTIN, D. G. E. Numerical evaluation of the Fermi beta-distribution function, 4090

MARTIN, D. L. *See* NEWKIRK, J. B., 3911; STEPHENSON, S. T., 4904

MARTIN, D. S., JR. *See also* CHRISTIAN, D., 3023

MARTIN, D. S., JR, JENSEN, E. N., HUGHES, F. J. and NICHOLS, R. T. Radiations from Yb^{169}, 5689

MARTIN, D. W. Uniform speech-peak clipping in a uniform signal-to-noise spectrum ratio, 166. *See also* CORK, J. M., 5708, 8926, 9672

MARTIN, D. W. and TOUGER, M. L. Loudness balance methods for earphone response measurements, 1704

MARTIN, H. Convection processes in the gas centrifuge. Thermoconvection in a strong gravitational field, 5679. *See also* HARRAND, M., 4296

MARTIN, H. C., JR. *See* CONNELL, L. F., JR, 2605

MARTIN, H. H. Plane rotational Prandtl-Meyer flows, 886

MARTIN, M. H. Steady, plane, rotational Prandtl-Meyer flow of a polytropic gas, 5168

MARTIN, P. M. E. *See* JONES, D. M., 9346

MARTIN, R. *See* BRIX, P., 4597

MARTIN, R. G. and THOMPSON, C. N. A vacuum pretreatment apparatus for filtering dehydrating and degassing oil, 7611

MARTIN, R. J. L. *See* HUGHES, E. D., 1391

MARTIN, R. L. *See* GREENWOOD, N. N., 9323

MARTIN, S. L. and WESTON, G. F. The spectral emittance of nickel- and oxide-coated nickel coated cathodes, 2492

MARTINELLI, E. A. *See* MATHER, J. W., 7295

MARTINELLI, L. A new type of mercury barometer with an optical system for reading, 6073

MARTINOT-LAGARDE, A. A remark about standardization and "A dimensional analysis of metal cutting," 682

MARTIUS, U. M. The effects of elastic deformation on magnetic properties of polycrystalline metals, 3631. *See also* CHALMERS, B., 6564

MARTIUS, U. M., GOW, K. V. and CHALMERS, B. Ferromagnetic domains in bicrystals of nickel, 5560

MARTON, L. and SIMPSON, J. A. Electron optical disk, 4428

MARTY, N. Spectrometry of β and γ-rays from artificial radio-active substances, 8168

MARTYN, D. F. The theory of magnetic storms and auroras, 3223

MARTYNOV, D. J. On a forgotten paper by M. A. Kovalsky, 41

MARUSSI, A. Principles of intrinsic geodesy, 5056

MARX, G. Some notes on the quantisation of real fields, 7515

MARX, H. On Lange's representation of the 3rd-order image errors. II, 930. The calculation of aberrational and Eikonal coefficients of any order for symmetrical optical systems with spherical and plane surfaces, 931

MARX, J. Use of the piezoelectric gauge for internal friction measurements, 8257

MARYOTT, A. A. *See* MALMBERG, C. G. 2665

MASEVICH, A. G. Problem of the evolution of stars in dispersed clusters, 2342. *See also* PARENAGO, P. P., 52

MASEVICH, A. G. and PARENAGO, P. P. Investigation of the mass-luminosity-radius relation. II, 6002

MASING, G. *See* DÜSTMANN, I., 7849; KUHLMANN, D., 3826

MASKET, A. V. and WILLIAMS, L. B. Nuclear emulsion scanning mechanism, 5731

MASLAN, F. and ABERTH, E. Equation of state for liquids, 6188

MASLOV, E. N. Friction coefficient in sliding and scratching of metals, 2113

MASLOV, P. G. On the method of determining vibrations of polyatomic molecules, 7145

MASON, B. J. The formation of ice crystals and snowflakes, 4943. Spontaneous condensation of water vapour in expansion chamber experiments, 9422

MASON, B. J. and LUDLAM, F. H. The microphysics of clouds, 7417

MASON, J. H. Random noise in dielectric materials, 4410

MASON, W. P. Piezoelectric crystals and their application to ultrasonics, 302. A phenomenological derivation of the first- and second-order magnetostriction and morphic effects for a nickel crystal, 5624. Zero temperature coefficient quartz crystals for very high temperatures, 7371. Domain wall relaxation in nickel, 8081. *See also* BOND, W. L., 6956

MASON, W. P. and WICK, R. F. A barium titanate transducer capable of large motion at an ultrasonic frequency, 5200

MASSALSKI, J. M. *See* MIESOWICZ, M., 7990

MASSEVICH, A. G. *See under* MASEVICH, A. G.

MASSEY, H. S. W. *See also* BATES, D. R., 1890

MASSEY, H. S. W. and MOISEIWITSCH, B. L. The application of variational methods to atomic scattering problems. I. The elastic scattering of electrons by hydrogen atoms, 3572

MASSIE, D. S. *See* CASADO, F. L., 6777

MASSIGNON, D. On the quantum hydrodynamics of helium at very low temperatures. I. Bose–Einstein condensation; II. The two fluids, 6178

MASSON, C. R. and STEACIE, E. W. R. The mercury photo-sensitized decomposition of methyl chloride, 4850

Masson, G. Chronograph recording to 1 millisecond, 823. Chronograph recording to 0·001 sec (Belin), 5059
Mastick, D. F. *See* Brewer, L., 7328
Mastrangelo, S. V. R. *See* Aston, J. G., 9090
Masuda, T. *See* Sekido, Y., 8446
Masuda, Y. *See* Kanda, T., 9643
Masumoto, H. and Otomo, G. On the dynamical characteristics of the magnetostriction alloy "Alfer," 8034
Mateosian, E. der. *See* der Mateosian, E.
Mather, J. W., Martinelli, E. A. and Jarmie, W. N. An attempt to detect μ-meson pairs from 322-MeV bremsstrahlung, 7295
Mather, K. B. Proton-proton scattering at 5 MeV, 4455. Scattering of 20 MeV alpha-particles by helium, 6268. *See also* Karr, H. J., 2759
Matheson, L. A. and Caldecourt, V. J. Electrical charge storage in polystyrene capacitors, 9437
Mathews, W. E. Transmission-line equivalent of electronic travelling-wave systems, 3655
Mathias, B. and von Hippel, A. Domain structure and dielectric response of barium titanate single crystals, 8711
Mathieson, A. McL. Design for an equi-inclination Weissenberg goniometer, 5911
Mathieson, A. R. *See* Jordan, D. O., 4823
Mathieu, J.-P. Vibration frequencies of hydrated ions, 980. Remarks on the study of infrared absorption by the powder method, 7729. *See also* Couture-Mathieu, L., 979
Mathieu, J.-P., Aguirre, R. M. and Couture-Mathieu, L. Raman spectra of NH_4Cl at low temperatures, 4298
Mathieu, J.-P. and Couture-Mathieu, L. The vibration spectrum of [zinc] blende, 9375
Mathieu, J.-P. and Lounsbury, M. The Raman spectra of metallic nitrates and the structure of concentrated solutions of electrolytes, 7772
Mathieu-Sicaud, A. *See* Bagno, O., 5876
Mathis, H. F. On a theorem of Brouwer, 7445
Mathis, R. The absorption of atmospheric vapour in the near infrared (the bands at 2·7 and 1·8 μ), 3445
Mathis-Noël, R. Contribution to the study of the absorption of methyl halides in the 1·6 μ region, 7709. The infrared spectrum of H_2S at 1·6 μ, 8644
Mathov, E. M. de. *See* de Mathov, E. M.
Matland, C. G. *See* Alpert, D., 7583
Matossi, F. Interpretation of the vibration spectrum of mix-crystals, 4574. The variation of atomic polarizabilities in molecular vibrations, 8098. *See also* Oldham, M. S., 987
Matricon, M. A study of the heat distribution in the target of an X-ray tube, 4014
Matsen, F. A. Molecular orbital theory and spectra of monosubstituted benzenes. I. The resonance effect, 2883. *See also* Music, J. F., 2887; Robertson, W. W., 2884–6, 2888; Walsh, J. M., 5648
Matsuda, H. *See* Ogata, K., 8151
Matsuda, K. and Ono, N. Measurement of thermal diffusion ratio by "bending balance," 1653
Matsuda, S. On the superlattice formation in binary alloys of body-centred cubic type, 9015
Matsuhara, T. and Nagamiya, T. Phase transition in NaCN and KCN, 6567
Matsumoto, T. Theory of electromagnetic shielding by shielding room of wire-netting, 4548
Matsumura, T. *See* Hibi, T., 4383
Matsushima, S. *See* Ueno, S., 8477
Matsuyama, T. Application of the Study's coordinate of a straight line to geometrical optics. I, 6096
Matta, K. and Richardson, E. G. A hot-wire ultrasonic interferometer and its application to vapors, 4193
Mattarolo, L. Method of determining the thermal diffusivity of poor conductors of heat, 1795
Matthews, P. T. Spinless mesons in the electromagnetic field, 1613. Spinless mesons and nucleons in the electromagnetic field, 1614. Renormalization of the meson-photon-nucleon interaction, 3329. Renormalization of neutral mesons in three-field problems, 5101
Matthias, B. T. Ferroelectricity, 6947. *See also* Hulm, J. K., 294, 1818
Matthias, B. T. and Hulm, J. K. New ferroelectric tartrates, 5391
Matthias, B. T. and Remeika, J. P. Dielectric properties and potassium niobates, 5394
Mattler, J. *See* Destriau, G., 1759
Matubayasi, T. *See* Takeyama, H., 6147, 6242, 9506
Matveeva, R. G. *See* Belov, N. V., 750
Maue, A.-W. Magnetic moments of elementary particles with higher spin, 848
Maurer, J. *See* Forestier, H., 6544
Maurer, R. *See* Mapother, D., 658
Maurer, R. D. and Herlin, M. A. Pressure dependence of second sound velocity in liquid helium II, 4343
Maurer, R. J. *See* Klick, C. C., 2653
Mawardi, O. K. On the generalization of the concept of impedance in acoustics, 8598
Maxted, E. B., Moon, K. L. and Overgage, E. The relationship between sensitivity to poisoning and catalytic surface, 1424
Maxwell, A. Radio emission from the sunspot of central meridian passage 1950, June 14, 6697. *See* Little, C. G., 4956
Maxwell, E. *See* Herzfeld, K. F., 323
Maxwell, L. R. *See also* Lucfy, C. W., 4590; Trounson, E. P., 490
Maxwell, L. R., Smart, J. S. and Brunauer, S. Thermomagnetic investigations of promoted and unpromoted iron oxide and iron catalysts, 4836
May, A. and Woodhull, J. C. The virtual mass of a sphere entering water vertically, 871
May, J. *See* Smaller, B., 218
May, M. and Wick, G. C. On the production of polarized high energy X-rays, 4418
Mayburg, S. Variation of dielectric constants of ionic crsytals with pressure, 9448
Mayer, H. On the freeing of electrons when metal atoms are bound together in a compact metal, 1957
Mayer, J. E. The theory of ionic solutions, 2424. Note on the theory of critical phenomena, 7813
Mayer, S. E. *See* Scott, T. R., 7891
Mayneord, W. V. Some applications of nuclear physics in medicine, 8405
Mayo, E. G. *See* Middleton, W. E. K., 7654
Mayot, M. Determination of the proper values and directions of a matrix, 1558. Perturbation calculations in quantum mechanics, 3319. The prediction of Wolf numbers, and linear analysis, 8453
Mayot, M., Berthier, G. and Pullman, B. Quantum calculation of the diamagnetic anisotropy of organic molecules. I. The method, 8875
Mayr, G. Influence of a magnetic field on the crystallization and composition of mixed crystals, 9808
Mays, J. M. and Townes, C. H. The nuclear spins and quadrupole moments of stable germanium isotopes, 5661
Maze, R. Local penetrating events underground, 2808. A penetrating component secondary to normal [μ] mesons, 8828
Maze, R. and Thouvenin, J. On the nature of the secondary radiation of ordinary mesons, 3046
Maze, R. and Tsai-Chü. The existence of a secondary maximum in the transition curve of electron-photon showers, 2795
Mazur, P. *See also* de Groot, S. R., 1809, 6179; Prigogine, I., 8695
Mazur, P. and Prigogine, I. Thermodynamics of thermomagnetic and galvanomagnetic effects, 7828. On the hydrodynamics of liquid mixtures of He^3 and He^4, 8696
Mead, D. J. *See* Forster, M. J., 6219
Meadowcroft, A. J. *See* Chesterman, W. D., 4026, 9904
Meadows, J. W. and Holt, R. B. Excitation functions for proton reactions with sodium and magnesium, 7260
Meakins, R. J. and Sack, R. A. The dielectric properties of symmetrical long-chain secondary alcohols in the solid state, 8722
Mecke, R. Infra-red spectra of hydroxylic compounds, 7705
Medhurst, C. W. An instrument for automatically recording waviness of surfaces, 6767
Medicus, H., Maeder, D. and Schneider, H. The decay of Mo^{99} and the isomerism of Tc^{99}, 4642

Medicus, H. A. Production ratio of photomesons from beryllium, 8200
Medicus, H. A. and Preiswerk, P. The isomeric transition of Tc^{95}, 3720
Medley, J. A. Frictional electrification and gaseous discharge, 284
Medlock, R. S. Oxygen analysis based on its paramagnetic properties, 3890
Medvedev, B. V. *See* Bogolyubov, N. N., 2366
Meek, J. H. Characteristics of *E*-region sporadic ionization in Canada, 6629
Meek, J. M. *See* Craggs, J. D., 2710
Meeks, M. L. *See* Greuling, E, 5723
Megaw, E. C. S. Scattering of electromagnetic waves by atmospheric turbulence, 2219. Spectrum of atmospheric turbulence, 4948
Meggers, W. F. Fundamental research in atomic spectra, 5255. Multiplets and terms in technetium spectra, 9368. *See also* Kessler, K. G., 3695
Meggers, W. F. and Kessler, K. G. Wave-lengths of mercury 198, 1720
Meggers, W. F. and Scribner, B. F. Arc and spark spectra of technetium, 5248
Meggers, W. F., Scribner, B. F. and Bozman, R. Absorption and emission spectra of promethium, 5249
Meggers, W. F., Shenstone, A. G. and Moore, C. E. First spectrum of arsenic, 2509
Mehrotra, R. R. *See* Banerjee, S. S., 8856
Mehta, G. K. *See also* Tawde, N. R., 2551
Mehta, G. K. and Rajeswari, V. C_2 (Swan) bands in krypton, 5257
Mei, J. Y. A note on the calculation of the Fermi function in the theory of beta-decay, 4665
Mei, J. Y., Huddleston, C. M. and Mitchell, A. C. G. Gamma-rays of Ag^{105} and Ag^{106}, 1288
Meigh, D. F. *See* Hughes, E. D., 1391
Meijer, P. H. E. Interpretation of microwave spectra of diluted iron ammonium alum, 2531
Meijer, R. R. *See* Bay, Z., 6406
Meĭklyar, P. V. The nature of photosensitivity of photographic emulsions, 6668. Relaxation properties of photoconduction in silver halides, 8739. *See also* Gremishin, S. G., 3248; Kartuzhanskiĭ, A. L., 8412
Meinel, A.-B. O_2 emission bands in the infrared spectrum of the night sky, 2225. Evidence for the entry into the upper atmosphere of high-speed protons during auroral activity, 2231. New bands of N_2^+ in the infrared spectrum of the aurora, 2232. A new band system of N_2^+ in the infrared auroral spectrum, 3239. Doppler-shifted auroral hydrogen emission, 4000. On the entry into the earth's atmosphere of 57-keV protons during auroral activity, 4002. The spectrum of the airglow and the aurora, 7420. The auroral spectrum from 6 200 to 8 900 A, 7424
Meinhold, H. The electrical charges on an aeroplane under icing conditions in thunderclouds, 9854
Meinke, H. The behaviour of electromagnetic waves in strongly inhomogeneous conduction paths, 3661
Meinke, W. W. Observations on radioactive snows at Ann Arbor, Michigan, 7203
Meinke, W. W., Ghiorso, A. and Seaborg, G. T. Artificial chains collateral to the heavy radioactive families, 4653
Meissner, H. *See* Schmeissner, F., 1010
Meister, A. G. *See* Decker, C. E., 6375; El-Sabban, M. Z., 7735; Ferigle, S. M., 8097; Klein, M. J., 8099; Voelz, F. L., 8881
Meites, L. *See* Bogan, S., 5895
Mesksyn, D. Motion in the wake of a thin plate at zero incidence, 6787
Meksyn, D. and Stuart, J. T. Stability of viscous motion between parallel planes for finite disturbances, 8546
Melchior, P. J. On the influence of the law of distribution of density in the earth's interior on the luni-solar variation of gravity at a point, 1520. A new method of analysis of the movement of the pole at the surface of the earth, 6008
Melchior, P. J. and Huaux, A. The annual displacement of the axis of rotation of the earth with respect to the terrestial globe, in relation to an annual oscillation of the instantaneous principal axis of inertia of the earth, 6008
Melin, A. *See* Gillon, L., 2809
Melkonian, G. A. *See* Harteck, P., 2145
Mellon, M. G. Light absorption spectrometry, 389
See also Patterson, G. D., Jr, 3884
Mellor, D. P. *See* Dwyer, F. P., 2131; Stephenso
N. C., 5920
Mellors, R. C. Studies with a reflecting microscope
microspectroscopy of living and fixed cells, 7663
Melnikova, I. G. *See* Evstropev, K. S., 6212
Melville, H. W. *See also* Arlman, E. J., 724; Burnet
J. D., 3149; Burrell, C. M., 3509; Grassie, N., 6834
Majury, T. G., 3510–11
Melville, H. W. and Murray, A. J. R. The ultrasoni
degradation of polymers, 3178
Menary, J. W., Ubbelohde, A. R. and Woodward,
The thermal transition in caesium chloride i
relation to crystal structure, 8356
Mendelev, B. G. *See* Andreev, V. D., 5444
Mendelssohn, K. *See also* Allen, W. D., 1851
Bowers, R., 1803, 1806, 2626, 2635; Brown, J. B
1802; Chandrasekhar, B. S., 6930; Daunt, J. G.
1801
Mendelssohn, K. and Olsen, J. L. Heat flow in super
conductive alloys, 326. Anomalous heat flow i
superconductors, 2705
Mendelssohn, K. and White, G. K. Film transfer i
helium II. IV. The transfer rate on glass and metals
1804
Mendousse, J. S. On the theory of acoustic radiatio
pressure, 164
Mendoza, E. *See also* Goodman, B. B., 6979
Mendoza, E. and Thomas, J. G. The electrical resis
tance of gold, silver, and copper at low temperature
3531
Meneghetti, D. *See* Krueger, H. H. A., 2070
Menon, M. G. K. *See also* Fowler, P. H., 9722
Gottstein, K., 7954
Menon, M. G. K., O'Ceallaigh, C. and Rochat, O
Observations on the multiple scattering of ionizing
particles in photographic emulsions. II. The scattering of positrons at 105 and 185 MeV, 7941
Menter, J. W. A study of boundary lubricant films by electron diffraction, 3846. Apparatus for the study by electron diffraction of the effect of temperature o
surface films, 3081
Menter, J. W. and Tabor, D. Orientation of fatty aci
and soap films on metal surfaces, 3071
Menzel, D. H. and Sen, H. K. Transfer of radiation
II. Radiative transfer in absorption lines, 6712; III
Reflection effect in eclipsing binaries, 6713
Menzel, E. Missing reflections in [X-ray] oscillatio
photographs of large crystals, 5914. Image formation outside the focal plane, 9360. Multiple
microscopic light slit, 9410
Menzer, E. *See* Sittel, K., 3967
Menzerath, P. Typology of languages, 1691
Menzies, A. C. Infra-red and Raman spectra—recen
advances in Great Britain, 6121. Radiation measuring instruments for the infra-red to ultra-viole
waveband, 6838
Mercer, D. M. A. The voicing of organ flue pipes, 4206
Mercier, A. *See* Keberle, E., 63
Mercier, J. Acoustic radiation pressure, 7644
Mercier, R. and Petermann, L. On the formation o
images according to wave theory, 919
Meredith, W. J. Radiotherapeutic physics. II. Dosage
in irradiated soft tissue and bone (appendix), 9881
V. Dosage control in interstitial gamma ray therapy,
9884
Meriç, S. The annihilation of positrons. One-quantum
and two-quanta annihilation in motion, 2986. The
coincidence measurements of the beta and gamma
radiations of Cu^{64}, 8167
Méring, J. *See* Brindley, G. W., 9136
Merkle, T. C., Jr. *See also* Goldwasser, E. L., 7048
Merkle, T. C., Jr, Goldwasser, E. L. and Brode, R. B.
The intensity and masses of cosmic-ray particles, 415
Merland, A. and Lévêque, S. A very sensitive radiometer, 4220
Merlin, M. *See also* Belliboni, G., 8183, 8826;
Dallaporta, N., 3049; Setti, R. L., 9577
Merlin, M. and Pierucci, O. Method of distinguishing
2-pronged stars in nuclear emulsions, 8787
Merrett, F. M. and Norrish, R. G. W. Aspects of
polymerization at high pressures, 5857

Merrifield, P. *See* Weiser, H. B., 1444

Merrison, A. W. and Wiblin, E. R. The Harwell time-of-flight neutron spectrometer, 4766

Merrit, J. *See* Richman, C., 3043

Merritt, F. R. *See* Galt, J. K., 4520; Yager, W. A., 1929, 4521

Merritt, W. F. *See* Yaffe, L., 6468

Mersman, W. A. A new form of solution of Hermite's equation, 3399

Mertens, R. Diffraction of light by supersonic waves, 6148

Merton, T. R. Use of diffraction gratings ruled on cylinders, 1772

Merwe, J. H. van der. *See* van der Merwe, J. H.

Meryer, D. R. *See* Egan, J. P., 2258

Merz, W. J. The dielectric properties of BaTiO$_3$ at low temperatures, 5396. Lithium ammonium tartrate monohydrate, a new ferroelectric crystal, 6203. Electric and optical behaviour of BaTiO$_3$ single-domain crystals, 8711. *See also* Caspari, M. E., 2678

Merzbacher, E. Note on higher order effects in beta-decay, 5721

Meschan, I., Edwards, R. R. and Rosenbaum, P. J. Practical physical aspects in the use of radioactive cobalt 60 as a radium substitute, 4977

Mesnard, G. The polarization of electrodes in the electrophoresis and electrolysis of thorium oxide and thorium nitrate, 334. Thermionic properties and activation of thoria, 1145. Thermo-electronic processes in thoria cathodes, 1146. Semi-conducting properties of thoria in vacuo, 6215

Mesnard, G. and Uzan, R. On the optical emissivity of thoria, 923

Messel, H. On some recent calculations on cascade shower theory, 5527. On the theory of a nucleon cascade, 6446. On the fluctuation of a nucleon cascade in homogeneous nuclear matter and calculation of average numbers, 6447. A note on the development of the nucleon component of the cosmic radiation in air when ionization losses are accounted for, 7047. On the nucleon cascade with ionization loss, 7253. Average numbers for the development of the nucleon component of the cosmic radiation in air, 7993. Further results on the fluctuation problem in electron-photon cascade shower theory and the probability distribution function, 9530. *See also* Green, H. S., 8514; Jánossy, L., 435, 2794

Messel, H. and Ritson, D. M. On the development of the nucleon component of the cosmic radiation in air, 1907. Energy losses of ionizing particles at relativistic velocities in the photographic plate, 2286

Messiah, A. On the scattering of "slow" neutrons by an isotropic harmonic oscillator, 9002

Messiah, A. M. L. *See also* Case, K. M., 6044; Longmire, C. L., 8173

Messiah, A. M. L., Caianiello, E. R. and Basri, S. π^--meson reactions in tritium, 8225

Metcalf, D. F. *See* Straiton, A. W., 8857

Metcalf, W. S. *See* Bowen, E. J., 5292

Metcalfe, A. G. The use of platinum thermocouples in vacuo at high temperatures, 271

Metlay, M. *See* Burwell, R. L., Jr, 138

Metropolis, N. and Reitz, J. R. Solutions of the Fermi–Thomas–Dirac equation, 5652

Metson, G. H. The physical basis of the residual vacuum characteristic of a thermionic valve, 3596

Metz, A. New optical precision measuring instruments for the workshop, 4125. The Forster surface measuring instrument, 4128. A problem relating to a disk rotating in a Galilean system, 6017

Metzger, F. R. Lower limit for the lifetime of the 0·8 MeV excited level of Mo^{96}. 8916. *See also* Hill, R. D., 8947

Metzger, F. R. and Hill, R. D. Disintegration scheme of Re^{186}, 5707

Metzger, K. J. *See* Kelly, W. C., 9525

Meulemans, G., Occhialini, G. P. S. and Vincent, A. M. The wire method of loading nuclear emulsions, 8182

Mévergnies, M. Nève de. *See* Nève de Mévergnies, M.

Meyenfisch, E. The sudden impact of a moving gas column against one at rest, 6072

Meyer, A. J. P. Measurement of the gyromagnetic constant of ferromagnetic elements and of some isoelectronic alloys of the Fe group, 4524. Gyromagnetic ratios in ferromagnetics of the iron group, 7073

Meyer, A.-J.-P. and Taglang, P. The magnetic moments and Curie points of hexagonal and cubic cobalt, 1177. The magnetic properties of copper in solid solution in cobalt and the alloy FeNi, 1923. The ferromagnetism of the alloy FeB$_2$, 6343. On the ferromagnetism of the β_1 phase of Co–Zn alloys, 8030

Meyer, D. R. *See* Mote, F. A., 2252

Meyer, H. *See* Clusius, K., 9327

Meyer, H. A., Schwachheim, G. and Wataghin, A. On the absorption of penetrating showers, 5530. Contribution to the study of penetrating showers, 9569

Meyer, K. and Ulbricht, H. Diffusion phenomena in multi-layer colour-photography materials, 9907

Meyer, K. P., Baldinger, E. and Huber, P. The short-lived metastable state of Hg^{198}, studied by delayed coincidences, 1267

Meyer, L. *See* Long, E., 8698

Meyer, L. *See* Long, E. A., 1016

Meyer, M. F. Fokker's organ in Huygens' tuning, 5207. Sound analysis without resonance, 5211

Meyer, P. The energy Qnp of the process N^{14}(n, p)C^{14}, 1309

Meyer, R. On the theory of marginal refraction in ice clouds, 3990

Meyer-Eppler, W. Vibration analysis by search-tone methods, 913. Reversed speech and repetition systems as means of phonetic research, 1700

Meyerhof, W. E. *See also* West, H. I., Jr, 3591

Meyerhof, W. E. and Nicodemus, D. B. Neutron depolarization on scattering from carbon, paraffin, and phosphorus, 4768

Meyermann, B. On the pulsation of the sun, 5022

Meyer-Schützmeister, L. Investigations into the external photoeffect in CuO and Cu$_2$O, 4386

Meyerott, R. E. *See also* Luke, P. J., 8903

Meyerott, R. E., Luke, P. J., Clendenin, W. W. and Geltman, S. A numerical variational method, 8534

Mezzetti, L. *See also* Quaranta, A. A., 9545

Mezzetti, L., Pancini, E. and Stoppini, G. Delays of penetrating particles in atmospheric showers, 4504

Mezzetti, L. and Querzoli, R. On the production and multiplicity of penetrating showers, 423. On penetrating showers generated in lead and carbon, 3607

Michaelis, E. G. and George, E. P. Measurements of the star-producing radiation with a scintillation counter, 9578

Michaels, A. S. and Hauser, E. A. Interfacial tension at elevated pressures and temperatures. II. Interfacial properties of hydrocarbon-water systems, 7597

Michard, R. Remarks on the Evershed effect, 6696

Michel, A. *See also* Guillaud, C., 3626

Michel, A., Chaudron, G. and Bénard, J. Properties of non-metallic ferromagnetic compunds, 6334

Michel, L. Reactions between nucleons and mesons, and the search for negative protons, 840. Corrigendum: Interaction between four half-spin particles and the decay of the μ-meson, 2377. Theorem on the invariant formed from four Dirac wave functions, 3341

Michel, P. *See* Goldsztaub, S., 8284

Michels, A., Lunbeck, R. J. and Wolkers, G. J. Thermodynamical properties of argon as function of pressure and temperature between 0 and 2000 atmospheres and 0° and 150°c, 8574

Michels, A. and Perez, J. P. Change of piezoelectric frequency of quartz under high pressure, 9454

Michels, A., Skelton, G. F. and Dumoulin, E. Gas-liquid phase equilibrium in the system ammonia-hydrogen-nitrogen, 3852

Michels, A. and Strijland, J. C. The specific heat at constant volume of carbon dioxide in the neighbourhood of the critical point, 2643

Michels, A., ten Seldam, C. A. and Overdijk, S. D. J. The dielectric constant of argon at 25°c and 125°c for pressures up to 2700 atmospheres, 9447

Michels, A. and Wassenaar, J. P. An instrument for the calibration of dynamometers, 1635

Michelssen, F. Notes on the development and application of infra-red-sensitive galena, PbS, PbSe, and PbTe photocells, 5413
Michijima, M. *See* Hachiya, K., 6074
Mida, J. *See* Watanabe, M., 403
Middleton, D. The distribution of energy in randomly modulated waves, 8069. On the theory of random noise. Phenomenological models, I, 9456; II, 9457
Middleton, R. *See also* El-Bedewi, F., 9696
Middleton, R. and Tai, C. T. Deuteron bombardment of neon, 9698
Middleton, W. E. K. The curve computer, 14
Middleton, W. E. K. and Mayo, E. G. Variation in the horizontal distribution of light from candlepower standards, 7654
Middleton, W. E. K. and Sanders, C. L. The absolute spectral diffuse reflectance of magnesium oxide, 6133
Mieghem, J. van. *See* van Mieghem, J.
Miesowicz, M. and Massalski, J. M. On the local gamma-radiation appearing in measurements of cosmic radiation at great depths, 7990
Migeotte, M. V. *See* Courtoy, C., 4275
Migeotte, P. and Rosen, B. Contribution to the spectroscopic study of the molecule NO, 200
Mignolet, J. C. P. Studies in contact potentials. I. The adsorption of some gases on evaporated nickel films, 1034; II. Vibrating cells for the vibrating condenser method, 1035
Mihama, K. *See* Honjo, G., 7310
Mihelich, J. W., Goldhaber, M. and Wilson, E. Cross-over transition in the decay of Tc^{99m}, 7204
Mihelich, J. W. and Hill, R. D. Radioactive isomers of Sn^{117} and Sn^{119}, 595
Miholić, S. Determination of the age of igneous rocks, 3227
Mikawa, Y. *See* Shimanouchi, T., 975
Mikhail, H. *See* Yousef, Y. L., 7059
Mikhailov, G. P. *See* Kobeko, P. P., 298–9
Mikhaĭlov, I. G. and Solovev, V. A. A simple method of measuring absorption of supersonic waves in strongly absorbing solid bodies, 9348
Mikhaĭlov, I. G. and Tarutina, L. I. Absorption of ultrasonic waves in gels, 2469
Mikhaĭlov, V. V. *See* Baldin, A. M., 8987
Mikhalevskiĭ, V. D. and Prokofeva, V. V. Investigation of the temperature of the metallic arc from the molecular spectrum of hydroxyl, 6181
Mikheev, V. I. Homology space groups, 8420
Mikhlin, S. G. On some estimates relating to the Green function, 8422
Milatz, J. M. W., Kluyver, J. C. and Hardebol, J. Determination of isotope ratios, e.g., in tracer work, by an infrared absorption method, 7754
Milberg, M. E. *See also* Geller, S., 9169
Milberg, M. E. and Lipscomb, W. N. The crystal structure of 1, 2-dichloroethane at − 50°c, 9165
Mileikowsky, C. *See also* Pauli, R. T., 3004
Mileikowsky, C. and Pauli, R. T. Thin target yield of $O^{18}(p, \alpha)N^{15}$, 609
Milford, F. J. *See also* Foldy, L. L., 2914
Milford, F. J. and Foldy, L. L. Energy degeneration of cosmic-ray primaries, 2783
Millar, C. H., Bartholomew, G. A. and Kinsey, B. B. γ-Rays from the decay of N^{16}, 3741
Millar, C. H., Cameron, A. G. W. and Glicksman, M. Gamma-ray studies using deuterium-loaded photographic plates, 1292
Millar, D. D. The transition effect of extensive air showers, 5526. The nature of the penetrating particles in extensive air showers, 7994. *See also* McCusker, C. B. A., 7056
Miller, A. R. Statistical aspects of chemisorption, 1414
Miller, B. L. and Hoecker, F. E. Quantitation of alpha emitters in bone, 8154
Miller, C. G. and Loeb, L. B. Positive coaxial cylindrical corona discharges in pure N_2, O_2, and mixtures thereof, 4405, 5440. Starting potentials of positive and negative coronas with coaxial geometry in pure N_2, pure O_2, and various mixtures at pressures from atmospheric to 27 mm, 6240
Miller, D. M. and Steacie, E. W. R. The recombination of methyl radicals, 4830
Miller, D. S. *See* Fisher, R. M., 2497
Miller, D. W. *See* Bockelman, C. K., 9710; Petree, B., 8986
Miller, F., Jr. Demonstration of phase shift using voltmeters, 9609
Miller, F. A. and Inskeep, R. G. The infra-red and Raman spectra of cyclopentane, cyclopentane–d_1, and cyclopentane–d_{10}, 2545
Miller, H. B. The discontinuous growth and decay of sound in a one-dimensional room, 8602
Miller, J. F. Stars produced in nuclear emulsion by carbon ions from the cyclotron, 9683
Miller, J. F., Hamilton, J. G., Purnam, T. M., Haymond, H. R. and Rossi, G. B. Acceleration of stripped C^{12} and C^{13} nuclei in the cyclotron, 1870
Miller, J. G. *See* Woodrow, C. C., 7171
Miller, G. A. Language engineering, 2479
Miller, K. S. The one-sided Green's function, 7447
Miller, M. M. *See also* Lippert, S., 6818
Miller, M. M. and Wilkinson, R. G. Scintillation studies of Os^{185}, 7217. The ratio of *L* to *K* electron capture for Os^{185}, 9675
Miller, N. The analogy between the chemical action of ionising radiation and that of ultrasonics on aqueous solutions, 7352
Miller, N. B. and Pleskov, V. A. Measuring exchange currents on amalgam electrodes by means of radioactive indicators, 3141
Miller, P. H., Jr. Semi-conducting materials. Electrical and optical properties of zinc oxide, 7867
Miller, R. D. Photo-nuclear stars in emulsions, 5762
Miller, R. D., Sewell, D. C. and Wright, R. W. The angular distribution of high energy neutrons from targets bombarded by 330-MeV protons, 4702
Miller, S. A. *See* Abbott, J. R., 9763
Miller, S. L., Javan, A. and Townes, C. H. The spin of O^{18}, 5282
Miller, W. Effective earth's radius for radiowave propagation beyond the horizon, 2867. Relative back-scattering of electrons and positrons, 5464
Miller, W. C. *See* Schillinger, E. J., Jr, 7278; Wolicki, E. J., 5779
Millership, R. and Webster, F. V. High frequency permeability of ferromagnetic materials, 508
Milligan, W. O. Recent X-ray diffraction studies on the hydrous oxides and hydroxides, 9783
Millington, G. The effect of the earth's magnetic field on short-wave communication by the ionosphere, 4560
Millman, P. M. Meteoric ionization, 4952
Millman, P. M. and McKinley, D. W. R. The correlation of visual meteor data with the character of meteor radar echoes, 5986
Mills, B. Y. A million-volt resonant-cavity X-ray tube, 1092. *See also* Christiansen, W. N., 803
Mills, B. Y. and Thomas, A. B. Observations of the source of radio-frequency radiation in the constellation of Cygnus, 8445
Millsaps, K. and McPherson, J. C. The oscillations of magnetic suspensions, 4176
Milne, A. A. *See* Barwell, F. T., 3838–9
Milne, E. A. Gravitation and magnetism, 3314
Milne, W. E. Numerical determination of characteristic numbers, 1563
Milner, C. J. *See* James, J. A., 2084
Milone, C. On the constitution of the extensive showers of cosmic rays, 9571
Milone, C., Tamburino, S. and Villari, C. On the distribution of penetrating particles in extensive cosmic ray showers, 420
Milton, J. G. D. *See* Fulbright, H. W.
Mims, W. and Halban, H. Positron electron branching, 3739. *K* capture in I^{128}, 9663
Mims, W., Halban, H. and Wilson, R. Internal pair creation in magnesium–24, 2028
Mimura, Y. An influence of cooling by vaporization on vaporization velocity, 255
Minakawa, O. *See* Fujioka, G., 5490, 5499
Minder, W. Radiation chemistry. VI. Radiation chemistry of organic halogen compounds, 9775
Mindlin, R. D. Thickness-shear and flexural vibrations of crystal plates, 3406
Mineo, M. On the transport of co-ordinates and azimuth along a geodesic and the inverse problem on any surface, 5057
Minkoff, G. J. Double beam percentage recording infra-red spectrometer, 178
Minnett, H. C. *See also* Piddington, J. H., 805, 8452

Minnett, H. C. and Labrum, N. R. Solar radiation at a wavelength of 3·18 centimetres, 807

Minorsky, N. On parametric excitation, 2460–1

Minter, C. C. and Burdy, L. M. J. Thermal conductivity bridge for gas analysis, 3889

Mintrop, L. The economic and scientific importance of geophysical methods for the investigation of the structure of mountain ranges and of usable deposits, 3214

Mirimanov, R. G. Diffraction of spherical electromagnetic waves on a paraboloid of rotation of limited size when the exciting field has a dipole perpendicular to the axis of symmetry of the paraboloid, 518

Mironov, K. E. *See* Belyaev, I. N., 2692

Mishra, B. On wave nature of matter, 8998. Molecular diffraction under high vacuum, 9726

Misiak, H. The decrease of critical flicker frequency with age, 7428

Miskin, E. A. Precision methods of measurement employing photographic techniques, 2289

Mitchell, A. C. G. On the addition energy for neutrons in the $h_{11/2}$ shell, 7178. *See also* Bunker, M. E., 588; Canada, R., 6441, 7220, 8936; Mei, J. Y., 1288

Mitchell, A. R. and Rutherford, D. E. Application of relaxation methods to compressible flow past a double wedge, 6075

Mitchell, E. W. J. and Mitchell, J. W. Semi-conducting materials. The work function of germanium, 7883

Mitchell, J. W. The theory of photographic processes, 7441. *See also* Allen, J. A., 1452; Mitchell, E. W. J., 7883

Mitchell, R. W. *See* Cleveland, F. F., 957

Mitra, A. P. Tides in the ionosphere, 3976

Mitra, S. C. *See* Khastgir, S. R., 8735

Mitra, S. K. Atomic nitrogen in auroras, 7423

Mitra, S. N. Fading of short wireless waves due to the interference between the magneto-ionic components, 1207

Mitrinovitch, D. S. On an indeterminable differential equation occurring in an important problem in elasticity, 4997

Mitsui, T. *See* Furuichi, J., 1041

Mitteldorf, A. J. Igniting an arc for spectrographic analysis in vacuum, 9412

Mittenthal, L. *See* Forrester, A. T., 3466

Miura, I. *See* Kameda, T., 9570

Miura, S. *See also* Ogawa, S., 5540

Miura, S. and Ogawa, S. On the star production by cosmic ray underground, 8824

Miwa, M. and Kageyama, S. Natural β-ray spectrum of RaC, 3733

Miyagawa, I. *See* Morino, Y., 7364

Miyake, S. *See* Kohra, K., 1519; Watase, Y., 8825

Miyamoto, G. On the spiral orbit spectrometer with two converging circles, 5461*

Miyamoto, S. Radiation field of extended stellar atmospheres, 3298. On the radiation field of Be-stars. I, 7484. On the radiation field of the planetary nebulae, 8470. On the ultraviolet emission of the chromosphere, 9239. On the excitation of helium in the chromosphere, 9243

Miyamoto, T. *See* Kamiyoshi, K., 6196, 7840

Miyamoto, Y. *See* Fukuda, H., 3045

Miyano, K. *See* Tazaki, H., 1352

Miyatake, O. *See* Yasaki, T., 624, 2921

Miyatani, S. *See* Makita, Y., 2260

Miyazawa, H. A possible explanation for the deviations of nuclear magnetic moment from the Schmidt lines, 8134. *See also* Fujimoto, Y., 5797

Miyazawa, H. and Okada, J. On the breakdown of alumina at higher temperature, 5446

Miyazima, T. Remarks on the field theory, 5080. *See also* Fukuda, N., 5094; Hanawa, S., 80, 5539; Hayakawa, S., 452; Nakano, T., 5095

Mizuno, J. *See* Hirone, T., 8028

Mizuki, E. *See* Fujisawa, S., 8413

Mizushima, M. A reply to Fu regarding the new method of estimating the surface area of powder, 4129. The theory of pressure broadening and its application to microwave spectra, 6850

Mizushima, M. and Ito, T. On the hyperfine structure of the rotational spectra of XYZ$_3$-type molecule, where nuclei Z have electric quadrupole moments, 6377

Mizushima, M. and Umezawa, M. Calculation of nuclear magnetic moments, 8127

Mizushima, S. *See also* Ichishama, I., 1755, 3459, 5375, 6953

Mizushima, S. and Morino, Y. Note on the rotational isomers of 1, 2-dihalogenoethanes, 2908

Mizushima, S. and Okada, J. Notes on the electrical and thermal conductivities of graphite and amorphous carbon, 5350

Mizushina, T. and Nakajima, M. Simultaneous heat and mass transfer, 8573

Moak, C. D. *See* Good, W. M., 8957

Mobley, R. C. *See also* Laubenstein, R. A., 9693

Mobley, R. C. and Laubenstein, R. A. Photo-neutron thresholds of beryllium and deuterium, 2045

Moch, R., Roth, E. and Salmon, J. Study with the electrolytic tank of ion sources used in mass spectrometry. Determination of trajectories, 1112

Moe, G. *See* Liu, T. K., 4284

Moelwyn-Hughes, E. A. Some aspects of the chemical statics and dynamics of proteins in solution, 3108

Moen, C. J. Ultrasonic absorption in liquids, 4188

Moen, L. *See* Crandell, F. F., 8666

Moffat, R. D. *See* Bunker, M. E., 1998, 2974, 5716; Langer, L. M., 590, 2959

Moffit, W., Comments on: Critical survey of the method of ionic-homopolar resonance, 7159. Comments on: The energies and bond lengths of conjugated molecules. An introductory review of theoretical developments, 7160

Moffitt, W. E. The ultra-violet spectrum of ethylene, 964. *See also* Koch, H. P., 3880

Mohanty, S. R. A relationship between heat conductivity and viscosity of liquids, 8543

Mohler, F. L. *See also* Dibeler, V. H., 2932, 5505; Reese, R. M., 5506

Mohler, F. L., Williamson, L. and Dean, H. M. Total ionization of hydrocarbons from mass spectral data, 2155

Mohler, O. C. Solar atomic lines in the 3-μ region, 8461

Mohrenstein, A., v. *See* v. Mohrenstein, A.

Moiseiwitsch, B. L. A variational method for inelastic collision problems, 6025. *See also* Massey, H. S. W., 3572

Moĭzhes, B. Ya. On the problem of excitation of electromagnetic oscillations, 2846

Mokulskiĭ, M. A. Relation between the classical equation of a self-coordinated field and the quantum mechanical one, 6729

Mol, H. A new interpretation of "residue," 4205

Mölbert, E. *See* Beyersdorfer, K., 9022

Molenaar, J. and Aarts, W. H. Change of resistivity by cold working at liquid-air temperature, 328

Moles, A. On phonetic characteristics of speech, 2481

Molière, G. Computation of operation of coincidence counters by extensive showers, 421

Molloy, C. T. Response peaks in finite horns, 153

Molnar, J. P. Form of transient currents in Townsend discharges with metastables, 8752. Studies of γ-processes of electron emission employing pulsed Townsend discharges on a millisecond time scale, 8753

Molnar, J. P. and Hartman, C. D. Induced absorption bands in MgO crystals, 1746

Momotani, M. *See* Seki, S., 7806

Monecke, O. On the Gamow convolutions of the low-energy regions, 8114

Monfils, A. Vibration-rotation spectrum and structure of monochlorosilane, 4276

Monfils, A. and Dechesne, J. The Raman spectrum of tetrafluoroethylene in the condensed phase, with further assignment of the fundamental frequencies, 1757

Monier, J. C. and Hocart, R. J. An equipment for the microscopic examination of metals and crystals in polarized light at temperatures from − 130 to + 35°c, 1006

Monk, C. B. *See* James, J. C., 3858

Montague, J. H. Electron loss cross sections for hydrogen atoms passing through hydrogen gas, 5503

Montalenti, G. Critical considerations on the model theories of hysteresis cycles of magnetic materials, 1935. *See also* Bonfigioli, G., 7808

Montel, E. and Ouang, T.-T. On Langevin's analyser for the study of mobilities of gaseous ions, 6288. *See also* Ferro, A., 5625

Montgomery, C. E. and Nicholls, R. W. Fractional transition probabilities of the first positive band system ($B^3\pi \rightarrow A^3\Sigma$) of molecular nitrogen, 6113

Montgomery, C. G. *See also* Tobey, A. R., 4512; Wei, J. N. P., 2788

Montgomery, C. G. and Montgomery, D. D. Scintillations produced by cosmic rays, 2572

Montgomery, D. D. *See* Montgomery, C. G., 2572

Montgomery, G. F. The cascaded binary counter with feedback, 6284

Montroll, E. W. *See also* Hart, R. W., 4312

Montroll, E. W. and Berlin, T. H. An analytical approach to the Ising problem, 9589

Moodie, M. M. and Reid, C. Energy transfer between complex molecules, 7687

Moody, H. J. *See* Haslam, R. N. H., 1996

Moody, N. F. An improved d.c. amplifier for portable ionization chamber instruments, 7040

Moody, N. F., Howell, W. D., Battell, W. J. and Taplin, R. H. A comprehensive counting system for nuclear physics research. I. Basic system and synthesis of simple instruments, 7973; II. Functional units. III. Automatic counting systems, 9553; IV. Introduction to pulse amplitude analyzers; V. The Chalk River pulse amplitude analyzer, 9554

Moon, K. L. *See* Maxted, E. B., 1424

Moon, M. L. *See also* Waggoner, M. A., 2018

Moon, M. L., Waggoner, M. A. and Roberts, A. Internal conversion coefficients of Sc^{46}, 596

Moon, P. and Spencer, D. E. Interflections in coupled enclosures, 172. A slide rule for lighting calculations, 4222

Moon, P. B. The hard components of scattered gamma-rays, 1293. Resonant nuclear scattering of gamma-rays: theory and preliminary experiments, 2990

Mooney, F. Prism reflections aiding index measurements, 4230

Mooney, H. M. A study of the energy content of the seismic waves P and *p*P, 5934

Mooney, M. Comment on "Relationship between Gough–Joule coefficients and moduli of vulcanized rubbers," 1361. Secondary stresses in viscoelastic flow, 9035. The viscosity of a concentrated suspension of spherical particles, 9074

Mooradian, A. J. and Gordon, W. E. Gaseous detonation. I. Initiation of detonation, 9049

Moore, A. C. The effect of pressure and friction on photographic emulsions, 2275. The adsorption of lubricant films: a study by radioactive tracers, 3850

Moore, A. D. Further development of fluid mappers, 6065

Moore, A. J. W. and Tegart, W. J. McG. Rupture of oxide films during repeated sliding, 9039

Moore, A. R. *See also* Sproull, R. L., 7377

Moore, A. R. and Herman, F. Electron bombardment induced conductivity in germanium point contact rectifiers, 4378

Moore, C. E. Atomic spectra for the astrophysicist, 7675. Technetium in the sun, 9241. *See also* Meggers, W. F., 2509

Moore, G. *See* Kohl, D., 9551

Moore, G. E., Allison, H. W. and Morrison, J. The reduction of SrO by tungsten in vacuum, 3117

Moore, G. E., Allison, H. W. and Struthers, J. D. I. The vaporization of strontium oxide, 2608

Moore, H. S. and Stein, M. Comparison of variously derived solar indexes, 3234

Moore, J. R. The generalized response of linear systems for arbitrary initial conditions, 5

Moore, N. P. W. *See* Egerton, A., 3495

Moore, R. K. A v.h.f. propagation phenomenon associated with aurora, 6367

Moore, W. J. and Lee, J. K. Oxidation kinetics of nickel and cobalt, 5856. Kinetics of the formation of oxide films on zinc foil, 9056

Moorhouse, R. G. Scattering of neutrons by ferromagnetic crystals, 5806

Mooring, F. P. *See* Bashkin, S., 5788; Shoemaker, F. C., 8964

Morais, C. Schmidt telescope studies, 8438

Morán, F. A direct derivation of the equation of Airy's wave front of the rainbow, 9219

Morand, M. The E–W asymmetry of isolated tracks produced by cosmic rays in nuclear emulsions, 442. *See also* Cüer, P., 600; Renardier, M., 2285

Morand, M., Beets, C. and Winand, L. Latitude effect of cosmic ray stars in photographic emulsions, 1168

Mordy, W. A. *See* Leopold, L. B., 6641

Moreau, J. *See* Benard, J., 2119

Moreland, R. E. *See* Burdick, M. D., 9418

Moreley, W. N. *See* Vand, V., 9164

Morellet, D. *See* Hoang, T.-C., 2279

Morelli, C. New criteria for the reduction of magnetic observations, 3220

Morette, C. On the definition and approximation of Feymman's path integrals, 4085

Morey, F. C. *See* Collett, C. T., 2402

Morgan, C. G. *See* Jones, F. Llewellyn, 4425, 6997

Morgan, F. H. Spectral emissivity of coatings of thoria and other refractories as a function of temperature, 2491

Morgan, G. D. *See* Jones, F. Llewellyn, 7920–1

Morgan, G. W. A study of motions in a rotating liquid, 3371

Morgan, L. O. *See* Turner, S. E., 4657

Morgan, M. G. and Evans, W. R., Jr. Synthesis and analysis of elliptic polarization loci in terms of space-quadrature sinusoidal components, 7113

Morganstern, K. H. *See* Ter-Pogossian, M., 1997, 4643

Morgenshtern, Z. L. Application of inflammable forms of phosphorus to photography in the infra-red section of the spectrum, 2288*

Morgenstern, Z. L. *See* Morgenshtern, Z. L.

Mori, H. *See* Ito, T., 9157

Mori, K. *See* Tanaka, Y., 6877

Mori, T. *See* Tajima, S., 9061

Mori, Y. *See* Araki, G., 7546

Morimoto, N. *See* Ito, T., 9147

Morin, F. J. Electrical properties of αFe_2O_3 and αFe_2O_3 containing titanium, 8736

Morino, Y. *See also* Mizushima, S., 2908

Morino, Y., Miyagawa, I. and Haga, T. Energy difference between the two rotational isomers of propylene dichloride, 7364

Moroz, L. M. *See* Gindin, L. G., 6248

Morozov, V. *See* Vaĭsenberg, A., 7951

Morpurgo, G. Photon production of mesons, 2063. Photoproduction of mesons in deuterium, 8977

Morrical, K. C., Benson, R. W. and Davis, H. The electrical and acoustical performance of some commercial audiometers, 1689

Morrill, W. Oriented crystals: their growth and their effects on magnetic properties, 745

Morris, W. J. and Schnurman, R. Temporary reduction of viscosity of liquids at high rates of shear, 3364

Morrish, A. H. *See also* Hooper, J. E., 3740

Morrish, A. H. and Dekker, A. J. The decays of luminescent KBr and LiF, 2557

Morrish, A. H., Williams, G. W. and Darby, E. K. Ultraviolet photon counting with an electron multiplier, 2498

Morrison, H. L. *See* Rogers, F. T., Jr, 254

Morrison, J. *See* Moore, G. E., 3117

Morrison, J. A. *See also* Los, J. M., 7821

Morrison, J. A. and Drain, L. A. The heat capacity of multimolecular layers of adsorbed argon, 9091

Morrison, J. A. and Los, J. M. The measurement of the thermal properties of gases and vapours adsorbed on solid surfaces, 1024

Morrison, J. D. Preliminary examination of the crystal structure, of colchiceine and its copper salt, 3213

Morrison, P. Interpretation of the decay scheme of K^{40}, 4656. *See also* Hornyak, W. F., 2911

Morrison, P. R. An automatic manometric respirometer, 4959

Moroz, L. M. *See* Gindin, L. G., 2721

Morton, H. S., Jr. *See* Beams, J. W., 4372

Morton, P. L. The California digital computer [CALDIC], 6675

Moruzzi, G. *See* Lepri, F., 3245

Morse, W. The dependence of shadow zone sound on the surface sound velocity gradient, 1680

Mosebach, R. The determination of the rates of outward growth of the faces of optically anistropic crystals, 2158. Microscopical-optical research into the growth phenomena of crystals in supersaturated solutions under directed pressure, 2160

Moseley, H. M. and Rosen, N. The meson as a composite particle, 854

Moser, H. *See* Lintner, K., 4728

Moses, C. and Platt, M. Changes in the total circulating eosinophile count in cyclotron workers, 8403

Moses, G. B. *See* Sirianni, A. F., 4857

Moses, H. E. and Wu, T.-Y. A self-consistent treatment of the oxygen dissociation region in the upper atmosphere, 7404

Mosher, W. A. *See* Naimark, G. M., 7637

Moshinsky, M. On the interactions of Birkhoff's gravitational field with the electromagnetic and pair fields, 1610. Boundary conditions for the description of nuclear reactions, 4688

Moss, E. The lubrication of cotton and other textiles, 3834

Moss, N. *See* Hanna, G. C., 4646, 4735, 4746

Moss, T. S. Changes in the activation energy of tellurium, 1061. The ultimate limits of sensitivity of lead sulfide and telluride photo-conductive detectors, 1841. Photoconductivity in magnesium antimonide layers, 1843. Photoconductivity in the elements, 6972

Mosteller, F. Theoretical backgrounds of the statistical methods, 8431

Mostovetch, N. Attempt to interpret the electrical conduction mechanism in very thin metal laminations, 9462

Mostovetch, N. and Vodar, B. Semi-conducting materials. Electrical conductivity of very thin metallic films evaporated in high vacuum, 7887

Moszkowski, S. A. A rapid method of calculating log ft values for β-transitions, 4664. On the type of interaction in β-decay, 5722. The interpretation of isomeric transitions, 9658

Mote, F. A. and Riopelle, A. J. The effect of varying the light-dark ratio of intermittent pre-exposure upon subsequent dark adaptation in the human eye, 4962

Mote, F. A., Riopelle, A. J. and Meyer, D. R. The effect of intermittent pre-adapting light upon subsequent dark adaptation in the human eye, 2252

Motokawa, K. *See also* Ebe, M., 5951

Motokawa, K., Ebe, M., Arakawa, Y. and Oikawa, T. Retinal colour responses to micro-stimulation, 6658. Studies of rod-process by polarization method, 7427

Mott, B. W. and Haines, H. R. Examination of metals under polarized light. I. Theory and apparatus, 3465; II. Applications, 4302

Mott, N. F. Semi-conducting materials. Semi-conductors, 7856. The mechanical properties of metals, 9748

Mottelson, B. R. Mirror levels in Li^7 and Be^7, 5656

Mott-Smith, H. M. The solution of the Boltzmann equation for a shock wave, 6801

Motz, H. Applications of the radiation from fast electron beams, 5470; Erratum, 9531

Motz, H. T. Masses of Al, Si, P and S isotopes, 6397

Motz, H. T. and Humphreys, R. F. Protons from the deuteron bombardment of enriched silicon and related atomic masses, 2040

Moucharafieh, H. *See* Renardier, M., 2285

Moucharrafieh, H. and Rebaud, S. Isolated tracks produced in nuclear emulsions by cosmic rays, 8010

Mouflard, M. and Lacombe, P. The distribution of plastic deformation in a sample of iron under tension, showing the Piobert–Luders effect, 3096. Relation between the heterogeneity of plastic deformation of iron and the critical amount of cold working. Application to the preparation of single crystals, 8266

Moureu, H., Chovin, P. and de Ficquelment, A. M. Cells depolarized by air. Static and dynamic polarization, 4844; Interpretation of static polarization, 3864.

Moussa, A. and Lafoucrière, J. On the analytical expressions of the vector potential of a magnetic field with symmetry of revolution, 8768

Moyal, J. E. The momentum and sign of fast cosmic ray particles, 412

Moyer, B. J. *See also* Chew, G. F., 4699; DeJuren, J., 5783; Gardner, W. L., 9732; Richardson, R. E., 8963

Moyer, B. J. and Chew, G. F. Collisions of high energy nuclear particles with nuclei, 4687

Mozley, R. F. Production of π^+-mesons by X-ray as a function of atomic number, 2062

Mrowca, B. A. *See also* Holroyd, L. V., 1459, 6550

Mrowca, B. A., Holroyd, L. V. and Guth, E. Study of high polymers by nuclear magnetism. II. Line width through transition temperatures, 1460

Muehlhause, C. O. On spin dependent nuclear "radii," 1242. *See also* Harris, S. P., 2073, 3035; Hibdon, C. T., 6483

Mueller, C. R. and Eyring, H. An average field calculation of the polarity of the carbon-hydrogen bond, 4866. The overlap average and central field approximations, 7170

Mueller, G. New apparatus for the estimation of moisture by the thermal principle, 4879

Muench, N. *See* Houston, W. V., 327

Muether, H. R. and Ridgway, S. L. The shape of the low energy beta-spectrum of Rb^{86}, 2978

Mugele, R. A. and Evans, H. D. Droplet size distribution in sprays, 8551

Mühleisen, R. Upward lightning discharges for thunderclouds, 6653

Mühlig, F. The 24 m interference comparator of the Potsdam Geodetic Institute, 6012

Mühlschlegel, B. Measurement of light absorption in microcrystalline powders, 6878

Muirhead, H. *See* Davies, J. H., 634

Mukerji, S. K. and Lal, B. On the Raman spectrum of diphenylmethane, 7767

Mukherjee, B. Colour of beryl, 6559

Mukherjee, N. R. On the latent heat of fusion and the hole theory, 5370

Mukherjee, N. R. and Row, O. Studies of thin films by electron diffraction, 7309

Mukherjee, S. R. Motion of a compressible fluid with varying viscosity given by $\mu = \mu_0 + \varepsilon_1 x$ for positive values of x, with reference to sound waves, 7586

Mulay, L. N. *See* Prasad, M., 8024

Muldawer, L. X-ray measurement of long-range order in β–AgZn, 5922

Mulder, J. *See* Prins, J. A., 8682

Müller, C. The mathematical theory of electromagnetic oscillations, 4542

Müller, E. W. Rendering visible single atoms and molecules in the field electron microscope, 1101

Müller, F. Measurements on hearing aids, 8603

Müller, F. H. The plastic-elastic behaviour of matter. (Dispersion of the modulus of elasticity with periodic deformation), 9028

Müller, H. On the question of intermediate statistics, 96. A method for the approximate determination of the position of energy bands in crystals, 9815. *See also* Reider, W., 9070

Müller, J. *See* Hund, F., 9888

Müller, M. An induction pulse method for the detection of petroleum, 1530

Muller, M. W. *See* Jepsen, R. L., 9566

Muller, P. The artificial repetition of certain short-lived astronomical phenomena by the aid of double-image observations, 4040

Müller, R. On the diffraction at a plane screen in a waveguide, 2855

Muller, T. *See* Thirion, J., 5754

Mulligan, J. F. LCAO self-consistent field calculation of the ground state of carbon dioxide, 4587

Mulligan, W. O. and Weiser, H. B. Orientation effects in transparent alumina films, 9741

Mulliken, R. S. Overlap integrals and chemical binding, 2147. Lewis acids and bases and molecular complexes, 5646. Overlap and bonding power of $2s$, $2p$-hybrid orbitals, 7152. Orthonormal sets of LCAO molecular orbitals for second-row homopolar diatomic molecules, 7169. *See also* Parr, R. G., 1215

Mullin, C. J. *See also* Guth, E., 7559

Mullin, C. J. and Guth, E. Electric excitation and disintegration of nuclei. I. Excitation and disintegration of nuclei by the Coulomb field of positive particles, 4709

Mulvey, J. H. *See* Gottstein, K., 7954

Mülwert, H. H. On the initiation of audible combination tones from primary oscillations in the ultrasonic range, 904

Mumford, W. W. *See* Easley, M. A., 6993

Münch, G. *See* Chandrasekhar, S., 2344–5, 3287, 8471

Mund, W. Remarks on the entropy constant and the third law of thermodynamics, 7570

Mund, W. and Coekelbergs, R. On the accurate determination of vapour densities and molecular masses, 6172
Mund, W. and Herman, J. A. Quantitative comparison of radiation chemical effects in liquid and gas phases, 8304
Mund, W. and Huyskens, P. Polymerisation of isobutene by α-particles, 2135
Mundie, L. G. *See* Oldham, M. S., 987
Mungal, A. G. *See* Clark, A. R., 8850
Munick, R. J., LaBerge, W. B. and Coomes, E. A. Periodic deviations in the Schottky effect for tantalum, 2776
Munk, M. M. The generality of mixed gas flow, 4168
Munson, W. A. *See* Anderson, A. B., 5953
Münster, A. Connection between intrinsic viscosity and molecular weight of nitrocelluloses, 727. Statistical mechanics of phase change. I, 6187. *See also* Haase, R., 9320
Mura, A. *See* Lovati, A., 2806, 5541, 9557
Murakami, H. Molecular compounds of the quinhydrone type, 6551
Murakawa, K. and Ross, J. S. Hyperfine structure of Sm^{149}, Sm^{147}, Nd^{145} and Nd^{143}, 7186
Murakawa, K. and Suwa, S. On some regularities in the isotope effect in the spectrum of lead, 1971. Revision of the hyperfine structure of the mercury spectrum, 2511
Murata, H. The Raman spectra of hexamethylcyclotrisiloxane and octamethylcylotetrasiloxane, 5301
Murata, H., Okawara, R. and Watase, T. The Raman spectra of ethylchlorosilanes, 976
Murawski, J. *See also* Szwarc, M., 9051
Murawski, J., Roberts, J. S. and Szwarc, M. Kinetics of the thermal decomposition of Di–*t*–butyl peroxide, 6527
Murin, A. and Lure, B. Experimental determination of the diffusion coefficient of sodium ions in sodium chloride, 3062
Murin, A., Lure, B. and Pavlov, V. Experiments for determining the mean range of recoil nuclei in heavy lead halides, 6451
Murphy, G. M. and Schoen, L. Isotope effect on hydrocarbon flame spectra, 4242
Murphy, G. M. and Vance, J. E. Thermodynamic functions for fluorine, 2649
Murphy, J. A. and Raymond, R. C. Dielectric constants of five gases at 9 400 megacycles per second, 291
Murphy, R. W. and Hughes, H. K. Simultaneous recording of two wave-lengths ranges with the Littrow spectrograph, 2153
Murray, A. J. R. *See* Melville, H. W., 3178
Murray, P. C. *See* Kupperiam, J. E., Jr, 4460
Murray, W. D., Schneider, C. S. and Smith, J. R. Development and utilization of constant-level balloons, 3966
Müser, H. Limits of performance of photoresistors (photoconductors), 6970
Musha, S. Studies on quantitative emission spectrum analysis. I. Influences of deviation on the supply electric-potential and cycle and one ellipsis of the standard samples, 6553; II. Determination of beryllium by liquid-condensed-sparking method, 6554; III. Quantitative analysis of boron by the solution method, 9120
Music, J. F. *See also* Robertson, W. W., 2888
Music, J. F. and Matsen, F. A. Molecular orbital theory and spectra of monosubstituted benzenes. V. Styrene, phenylacetylene and phenylcyclopropane, 2887
Mustel, E. R. and Severnyĭ, A. B. Spectrophotometry of chromospheric eruptions, 8460
Muto, T. and Inoue, K. Notes on Dirac's new quantized method in the field theory, 5085
Muto, T. and Oyama, S. Theory of the temperature effect of electronic energy bands in crystals, 5626, 8083
Muto, T. and Tanifuji, M. Interaction of μ-meson with matter. I. Nuclear excitation by electromagnetic interaction, 7255
Mutschler, E. C. *See* Pugh, E. M., 4990
Muxart, R. Studies on the mechanism of some chemical reactions by means of radio-sulphur, 3112
Muzikář, Č. *See* Votruba, V., 5799
Myers, D. T. *See* Chesterman, W. D., 9905
Myers, H. P. and Sucksmith, W. The spontaneous magnetization of cobalt, 7107
Myers, O. E., Jr. Studies of transmission zone plates, 8662
Myers, R. J. *See* Cunningham, G. L., Jr, 6126
Myers, V. Intermolecular forces in benzene and ammonia, 2889; Erratum, 4579
Myers, V. and Peters, R. Intermolecular forces in methyl chloride, 8092
Myers, W. R. Magnetism of hydrogen and lithium ions, 8035
Mylroi, M. G. *See also* Hyams, B. D., 439
Mylroi, M. G. and Wilson, J. G. On the proton component of the vertical cosmic-ray beam at sea level, 5518
Mysels, K. J. *See* Doscher, T. M., 5331

Nabarro, F. R. N. Restriction of prismatic punching to a limited class of crystals, 738. The force action on a body moving uniformly through a gas containing sound waves, 1683. The law of constant resolved shear stress in crystal plasticity, 3092. The interaction of screw dislocations and sound waves, 9344. *See also* Eshelby, J. D., 5827
Nabholz, H., Stoll, P. and Wäffler, H. The energy and angular distribution of the gamma-rays from the reaction Li^7 (p, γ) Be^8, 7259
Nadeau, G. Zonal correction of spherical observation in magnetic lenses, 7013
Nadi, M. el. *See* el Nadi, M.
Nag, B. D., Sen, S. and Chatterjee, S. Effect of time lag in the measurement of delayed coincidences with G.M. counters, 394*. On the disintegration of scandium (46) and the method of delayed coincidence for the study of short-lived metastable states in isomeric nuclei, 6407
Nagahara, Y. *See* Ogawa, S., 448, 7547; Yamada, E., 8219
Nagakura, T. Some remarks on the relativistic quantum field theory, 64
Nagamiya, T. *See* Matsuhara, T., 6567
Nagasu, H. Statistical features in static friction, 5842
Nagata, T. Longitudinal inequality of solar diurnal variation in geomagnetic field, 6615
Nagata, T. and Fukushima, N. Ionospheric bays accompanying geomagnetic bays, 6632
Nagel, M. On the spectral energy distribution in the image on the ground glass screen of a sphere illuminated by the sun, the sky and reflex light, 762. Equalization of the light intensity in the image plane in wide-angle objectives, 5341
Naggiar, V. *See* Conjeaud, M., 3732
Nail, V. McK. *See* Shapley, H., 5042
Naimark, G. M., Klair, J. and Mosher, W. A. A bibliography on sonic and ultrasonic vibration: biological, biochemical and biophysical applications, 7637
Naish, J. M. A multiplier photocell attachment for use with prism spectrographs, 5243
Naismith, R. and Bailey, R. An automatic ionospheric recorder for the frequency range 0·55 to 17 Mc/s, 1538, 2207
Nakabayasi, K. and Sato, I. Radiactive corrections to anomalous magnetic moment of nucleon in pseudoscalar meson theory, 8512
Nakada, O. *See* Oka, S., 8723
Nakagawa, Y. The theory of non-linear elasticity, 4798
Nakai, S. *See* Koba, Z., 641
Nakai, Y. *See* Uchida, Y., 6134
Nakajima, M. *See* Mizushina, T., 8573
Nakajima, S. and Shimizu, M. Two-fluid theory of liquid helium II below 1°K, 2627, 7816. On the mechano-caloric effect in liquid helium II, 5358
Nakajima, T. Theory of high polymer solutions, 4155
Nakamoto, K. *See* Tsuchida, R., 6132
Nakamura, M. *See* Watanabe, I., 1856
Nakamura, S. *See also* Taketani, M., 5106, 6389
Nakamura, S., Fukuda, H., Ono, K., Sasaki, M. and Taketani, M. Analysis on the two meson theory, 5115
Nakane, H. *See* Wada, E., 5193
Nakano, T., Watanabe, Y., Hanawa, S. and Miyazima, T. Radiactive corrections to decay processes. II. Beta-disintegration of nucleon, 5095

Nakatsu, K. *See* Seki, S., 7806

Nakayama, C. *See* Horio, M., 7316

Nambu, Y. Force potentials in quantum field theory, 5105. *See also* Kinoshita, T., 5093

Nanda, V. S. A note on Weyl's inequality, 779. Partition theory and thermodynamics of multidimensional oscillator assemblies, 9287

Narain, H. and Saksena, B. D. Low-frequency Raman lines in para-dichlorobenzene, 7768

Narayana Rao, D. A. A. S. Dielectric constants of cane sugar, 1039. Variation of dielectric constants of ionic crystals with pressure, 5393

Narayanan, P. S. Raman spectrum of rutile (TiO_2), 2560. Photometry of Raman spectra of crystals. II, 5305. Raman spectrum of apophyllite, 7769

Narbutt, K. I. *See* Barinskiĭ, R. L., 9515; Vaĭnshteĭn, E. E., 9513–14, 9516

Narita, S. *See* Arizumi, T., 5509, 6294

Nash, L. K. *See* Harris, F. E., 8323; Johnson, E. W., 4131

Nashed, S. *See* Wahba, M., 3153

Naslin, P. Electronics in short-time measurement and high-speed photography, 4025

Natanson, L. On the range-energy relation of low energy protons and α particles in a photographic emulsion, 7957

Nathan, A. M. A dynamic method for measuring the specific heat of metals, 4349

Naudé, S. M. and Verleger, H. Perturbations in the band spectrum of the sulphur molecule, 187. Perturbations in the ultraviolet band spectrum of the phosphorous molecule P_2, 1728

Naudin, F. The dielectric constant and loss-angle of glass, 4370. *See also* Maréchal, A., 4311; Winter-Klein, A., 269

Nauman, R. V. and Debye, P. Light-scattering investigations of carefully filtered sodium silicate solutions, 7353

Naumov, A. *See* Abdullaev, A., 5547

Navarro, J. A contribution to the study of the plastic deformation of metals by extension and by drawing, 674

Nawata, S. On the blisters produced on the evaporated aluminium film, 4780. On the distribution of temperature in the neighbourhood of [a] heated cylinder, 6165

Neale, S. M. *See* Ward, A. F. H., 1640, 3843

Nearhoof, H. J. *See* Benner, A. H., 2868

Nechaj, J. F. *See* Allen, A. J., 4698; Sun, K.-H., 5755, 6457*

Nederbragt, G. W. *See* Boelhouwer, J. W. M., 1638

Needels, T. S. *See also* Nielsen, C. E., 9558

Needels, T. S. and Nielsen, C. E. A continuously sensitive cloud chamber, 4476*

Néel, L. Magnetic viscosity, 6314. Influence of thermal expansion on the value of the Curie constant of ferrites, 6342. The reversal of the permanent magnetization of rocks, 8368

Nehemias, J. V. *See* Cowan, F. P., 4012

Neher, H. V. Energy distribution of the primary cosmic radiation, 8001. *See also* Hiehl, A. T., 8811

Neighbours, J. R. and Smith, C. S. An approximation method for the determination of the elastic constants of cubic single crystals, 1363

Neiler, J. *See* Owen, G. E., 7969

Neill, H. W. *See* Hagelbarger, D. W., 5683

Neill, T. R. and Emeléus, K. G. Plasma-electron oscillations, 3543

Neĭmark, I. E. and Khatset, F. I. On the phase state of the matter in an adsorptive layer, 3161

Nelson, C. N. and Hamsher, D. H. Photography of high altitude aerial objects, 3249

Nelson, H. Base-metal effects in thoria-coated filaments, 1896

Nelson, J. H. Short wave radio propagation correlation with planetary positrons, 9863

Nelson, J. R. and Berbert, J. H. Thermoluminescence of zinc silicate phosphors activated with manganese and arsenic, 9392

Nelson, R. C. The photoconductivity of some triphenylmethane dyes, 6224

Nemilov, Yu. A. A study of (d, p) nuclear reactions, 3766

Nemilov, Yu. A. and Funshtein, B. L. Angular distribution of protons in reactions $O^{16}(d, p)O^{17}$ and $Al^{27}(d, p)Al^{28}$, 610

Neovius, G. The arithmetical unit in a mathematical machine, 1564

Neppiras, E. A. *See* Noltingk, B. E., 161, 2477

Nesbitt, E. A. and Williams, H. J. Mechanism of magnetization of Alnico V, 1188

Nesbitt, L. B. *See* Serin, B., 2700

Nettelblad, F. Recordings of scintillations, 8440

Netter, F. *See* Benoist, P., 8206; Grimelands, B., 8205

Neu, J. T. and Gwinn, W. D. Rotational isomerism and the vibrational spectrum of 1, 2-dibromoethane, 3173

Neuberger, H. *See* Sherrod, J., 2197

Neubert, R. E. *See* Clark, J. W., 406

Neuendorfer, J. A., Inglis, D. R. and Hanna, S. S. Angular yield of deuterons and alphas from the proton bombardment of beryllium, 4708

Neuert, H. On the existence of a discharge-spread region in a counter tube with a pure vapour filling, 4463. Gas analysis with the use of a mass spectrometer, 4883. On the mechanism of the discharge process involving large pulses in pure vapour filled counters, 6275. *See also* Fünfer, E., 2762; Geerk, J., 1139

Neuert, H. and Geerk, J. On the behaviour of NH_3-filled counter tubes, 5485

Neuert, H. and Hänsel, H. Investigation of oxidation and corrosion processes on metal surfaces by the measurement of contact potentials, 1032

Neugebauer, H. E. J. A model of the events occurring in the retina as derived from the facts of colour vision, 5948. The natural vignetting of photo-objectives, 6912–13. Two instrumental aids for colour photography, 9908

Neuhaus, A. and Noll, W. Oriented crystalline deposits on active substrates, 743

Neuman, H. A note on the U operator, 7531

Neuman, M. *See* Karplus, R., 1609, 7524

Neumann, H. M. and Perlman, I. Long-lived Bi^{207} and energy levels of Pb^{207}, 5688

Neurath, P. W. and Koehler, J. S. The plastic deformation of pure single crystals of lead and copper, 5832

Nève de Mévergnies, M. and Delfosse, J. M. A study with a mass spectrometer of the decomposition of germanium hydride under the action of electronic bombardment, 3597

Neveling, V. *See* Braune, H., 5855

Neven, L. *See* de Jager, C., 2337

Newbery, S. P. *See* Sinclair, W. K., 8155

Newcombe, W. A. and Rohrlich, F. On the Lamb shift for spinless electrons, 4099

Newell, G., Jr and Dicke, R. H. A method for reducing the Doppler breadth of microwave absorption lines, 9385

Newell, G. F. Magnetic shielding constant of H_2, 1963

Newell, H. E., Jr and Pressly, E. C. A note on the geometry of Geiger counter telescopes, 2764

Newing, M. J. The surface properties of polar silicones, 1454

Newing, R. A. A six-vector development of some results in kinematical relativity, 8493

Newitt, D. M. *See* Barnard, A. J., 9758; Haselden, G. G., 9756

Newkirk, J. B., Smoluchowski, R., Geisler, A. H. and Martin, D. L. Phase equilibria in an ordering alloy system, 3911

Newlands, M. Rayleigh waves in a two-layer heterogenous medium, 3951

Newman, R. Proton magnetic resonance in polyethylene, 1226

Newman, R. and Badger, R. M. The infrared spectra of *N*-acetylglycine and diketopiperazine in polarized radiation at 25° and at −185°c, 8636

Newman, R. and Halford, R. S. Motions of molecules in condensed systems. VII. The infra-red spectra for single crystals of ammonium nitrate and thallous nitrate in polarized radiation, 196; VIII. Infra-red spectra for ammonium nitrate, thallous nitrate, and plumbous nitrate at −160° and 25°c, 197

Newman, R. and Ogg, R. A., Jr. Nuclear spin relaxation studies in dilute sodium-liquid ammonia solutions, 4156

Newman, S. and Eirich, F. Particle shape and the concentration dependence of sedimentation and diffusion, 4855

Newns, H. C. *See* Huby, R., 8218

Newton, C. J. and Colby, M. Y. Thermal expansion coefficients of α-monoclinic selenium, 8684
Newton, C. M. *See* Webster, D. L., 7847
Newton, J. O. *See* Curling, C. D., 613
Newton, R. R. *See* Rose, M. E., 5130
Ney, E. P. and Thon, D. M. Scintillation counting of cosmic-ray particles, 6302. A scintillation counter measurement of heavy nuclei, 6303
Neyret, G. *See* Debiesse, J., 3599, 7986
Neyron, A. *See* Kobrynski, M., 4186
Nicholas, J. F. *See* Clarebrough, L. M., 1355
Nicholas, J. W. and Pollak, F. F. A new cement for gelatine light filters, 2549
Nicholls, R. W. Mechanisms of excitation of the $C^3\pi_u$ state of molecular nitrogen, 2520. A mechanism of formation of nitric oxide in glow discharges, 4589. *See also* Montgomery, C. E., 6113; Turner, R. G., 5262
Nichols, M. H. A timing control for small spot welders, 7579. *See also* Hagelbarger, D. W., 5683
Nichols, R. T. *See* Jensen, E. N., 3736; Martin, D. S., Jr, 5689; Pratt, W. W., 4440
Nicholson, D. L. *See* Thompson, H. W., 7706
Nicholson, G. F. An introduction to the rationalized M.K.S. system of units, 6719
Nicholson, K. P. *See* Goodman, P., 2782
Nicholson, S. B. *See* Wulf, O. R., 1582
Nicodemus, D. B. *See* Meyerhof, W. E., 4768
Nicolet, M. Effects of the atmospheric scale height gradient on the variation of ionization and short wave absorption, 3978. *See also* Bates, D. R., 1534, 2224
Nicolini, T. Indications of correspondences between geophysical phenomena and motion of the pole, 820
Niday, J. B. *See* Turkevich, A., 9712
Niedner, J. B. *See* Keller, K. K., 4713
Nief, G. Measurement of ionization potentials with a mass spectrograph, 9559. *See also* Cassignol, C., 4449
Niekerk, J. N. van. *See* van Niekerk, J. N.
Niekisch, E. A. Photoconductivity of CdS single crystals at low temperatures, 5415
Nielsen, A. H. Analysis of the 774 cm^{-1} (ν_6) absorption band of F_2CO, 4272. *See also* Jones, E. A., 4251, 4283; Talley, R. M., 2543, 7745
Nielsen, A. H. and Jones, E. A. The analysis of the infrared spectrum of chlorine monofluoride, 8645
Nielsen, C. E. *See also* Needels, T. S., 4476
Nielsen, C. E., Needels, T. S. and Weddle, O. H. Diffusion cloud chambers, 9558
Nielsen, E. *See* Lord, R. C., 1756, 4282
Nielsen, H. H. A study of the low frequency fundamental bands in the spectrum of AsH_3, 7747. Anomalies in the microwave spectra of symmetric molecules, 8085. Anomalous intensity distribution of rotation lines in fundamental vibration bands in triatomic molecules, 8643. *See also* Bell, E. E., 962, 4273; Wood, D. L., 205
Nielsen, J. R., Claassen, H. H. and Smith, D. C. Infra-red and Raman spectra of fluorinated ethanes. II. 1, 1, 1-trifluoroethane, 2544
Nielsen, J. R., Liang, C.-Y. and Smith, D. C. Infra-red and Raman spectra of 1 : 3 : 5-trifluorobenzene, 7712
Nielsen, K. O. *See* Kofoed-Hansen, O., 5700*, 7206
Nielsen, L. E. A recording torsion pendulum for the measurement of the dynamic mechanical properties of plastics and rubbers, 9745
Nier, A. O. The atomic masses of H^1, C^{12}, and S^{32}, 4619. *See also* Halstead, R. E., 3392
Nier, A. O. and Roberts, T. R. The determination of atomic doublets by means of a mass spectrometer, 4621
Nier, A. O. and Thorness, R. B. An automatic chart plotter for lecture room demonstrations, 9257
Nier, M. Measurement of rapidly changing mechanical quantities by means of quartz pickups, photocell pickups and cathode ray oscillograph, 4132
Nierenberg, W. A. The intermediate cosine coupling in molecular beams, 3794. A new viewpoint in computing crystal frequencies, 6566. The intermediate spin-orbin coupling for large rotational quantum number, 7151
Niessen, K. F. On the deviations between theoretical and experimental values of the specific heat of superconductors, 1852. On the condition determining the transition temperature of a superconductor, 4395
Nifontoff, N. *See* Blanc-Lapierre, A., 8733–4
Niggli, A. and Niggli, P. Space-group symmetry and methods of crystal-structure calculation. I, 9806
Niggli, P. The complete and unambiguous designation of space groups by tables of characters. II, 1483. Vector presentation of 230 space groups, 3901. *See also* Niggli, A., 9806
Niguet, P. Asymmetry in the propagation of waves, 2866
Nijboer, B. R. A. *See also* Placzek, G., 5808
Nijboer, B. R. A. and van Hove, L. On the radial distribution function of an imperfect gas and the superposition principle, 7621
Nijgh, G. J. *See also* Verster, N. F., 8933
Nijgh, G. J., Verster, N. F., Nussbaum, R. H., van Lieshout, R. and Bakker, C. J. On the disintegration of 8·0d^{131}I, 9661
Nikitina, E. A. and Kokurina, A. S. Potassium wolfram bronze, 755
Nikitine, S. and El Komoss, S. G. On the theory of the metallic model of polymethine molecules taking account of the ionization. Application to the ultraviolet spectrum, 7720
Nikolskiĭ, S. I. Coincidental impulses in ionization chambers, 2802. *See also* Dobrotin, N. A., 8813
Nikonov, V. B. and Severnyĭ, A. B. The experiment in the electrophotometry of the solar spectrum, 5994
Nilsson, N. The *K*-absorption limit of antimony, 7001
Nilsson, S. B. and Laurikainen, K. V. On the gravitational self-energy of light, 1600
Nimura, T. and Watanabe, Y. Effects of a finite circular baffle board on acoustic radiations, 4196
Ning Hu. The *S*-matrix in meson theory, 3337
Nishihara, T. and Kori, T. Statics of powdered material under compression, 4809
Nishihara, T. and Taira, S. Effect of free surface on the yielding resistance of materials, 4803
Nishijima, K. On the elimination of the normal-dependent part from the Hamiltonian, 75. On the generalized transformation function and the integrability condition, 5083. Note on the eigenvalue problem in the quantum field theory, 6752
Nishimura, H. and Takamura, J. Effect of strain rate on the plastic deformation in aluminium single crystals, 9029
Nishimura, J. and Kamata, K. The lateral and angular distribution of cascade showers, 5523. On the accuracy of the Molière function. I, 8774
Nishina, K. *See* Fujimoto, Y., 5118
Nishiyama, T. An algebraic theory of the density matrix. II, 7544. *See also* Husimi, K., 6035
Nishura, J. *See* Hayakawa, S., 5524
Nisimoto, K. *See* Takeyama, H., 6242–3, 9506
Niskanen, E. *See* Tanni, L., 5058
Nitta, I., Sakurai, K. and Tomiie, Y. The crystal structure of orthorhombic hydrazonium sulphate, 9154
Nix, F. C. and Jaumot, F. E., Jr. Self-diffusion in cobalt, 1341, 4774
Nixon, E. R. and Cross, P. C. The intensities of several of the infra-red absorption bands of cyanogen and cyanogen chloride, 961; Erratum, 7752
Nixon, I. S. *See* Raumann, G., 1643
Nixon, W. C. *See* Cosslett, V. E., 7930
Noar, J. A mathematical formula relating photographic blackening and exposure, 8414
Noble, R. H. The hydrogen sulphide band at 1 183 cm^{-1}, 6871
Nødtvedt, H. Electromechanical analogies applied to magnetostrictive systems, 4568. The correlation function in the analysis of directive wave propagation, 9343
Noga, K. Thermo-electromotive force of BaO and (Ba–Sr)O, 5425
Noll, W. *See* Neuhaus, A., 743
Noltingk, B. E. Ultrasonic generators for high powers, 4202
Noltingk, B. E. and Neppiras, E. A. Ultrasonic soldering of aluminium, 161. Ultrasonic soldering irons, 2477

NOMARSKI, G. *See* FRANÇON, M., 3472
NOMURA, S. *See also* SAWADA, S., 1797, 6949, 8715
NOMURA, S. and SAWADA, S. On the anomalous dielectric properties of mixture of lead titanate and strontium titanate, 1038. D.C. resistance of barium titanate and its solid solutions ceramics, 1828. Dielectric and thermal properties of barium-lead titanates, 5395
NOMURA, Y. Note on the free volume of a liquid, 4149
NOMURA, Y. and KANDA, E. On the explosion of air-rectifying apparatus. II, 5361; III, 8694
NONAKA, I. and SHIMAZU, Z. Long beaded counters for X-ray measurements, 1122
NONAKA, I. and TANABE, S. Radioactivity of thoriated tungsten wire, 3181
NONNEMAKER, G. M. and STREET, J. C. Cloud chamber analysis of stopped particles in the sea-level cosmic radiation, 7053
NONWEILER, T. R. F. Aerodynamic heating at high speeds, 7613
NORBERG, R. E. and SLICHTER, C. P. Nuclear relaxation times in metallic Na^{23}, 9641
NORDHEIM, G. P. *See* SPONER, H., 7717
NORDSTRAND, R. A. VAN. *See* VAN NORDSTRAND, R. A.
NORDSTRÖM, S. *See* LUNELAND, H., 3982
NORINDER, H. and SALKA, O. Mechanism of positive spark discharges with long gaps in air at atmospheric pressure, 9505
NORINDER, H. and SIKSNA, R. Continued measurements of the variation characteristics of the density of small ions, 764. Variations in the density of small-ions caused by the accumulation of emanation exhaled from the soil, 2229
NORMAN, N. and WARREN, B. E. X-ray measurement of short range order in Ag–Au, 4784
NORRIS, D. J. *See* LLOYD, S. J., 3832
NORRIS, K. P., SEEDS, W. E. and WILKINS, M. H. F. Reflecting microscopes with spherical mirrors, 4318
NORRIS, K. P. and WILKINS, M. H. F. A reflecting microscope of 1·3 numerical aperture, 7796
NORRIS, T. H. and RUBEN, S. Kinetics of the isotopic exchange reaction between carbon monoxide and carbon dioxide, 3114
NORRISH, R. G. W. *See* ASHMORE, P. G., 690–1, 2117; BEVINGTON, J. C., 3883; MERRETT, F. M., 5857
NORTH, P. P. *See* FREVEL, L. K., 360
NORTHROP, J. A. The penetration of particles associated with cosmic-ray stars. II, 9572
NORTHWOOD, T. D. and ANDERSON, D. V. Velocity considerations in pulse propagation, 149
NOTUKI, M. On the ascending motion of the eruptive prominence of the sun. II, 8454
NOVIKOVA, Z. I. *See* KOBEKO, P. P., 298–9
NOVOSELSKAYA, N. A. The natural system of atomic nuclei and the problem of element 61, 2952
NOVOSILTSEV, N. S. Time relation in processes of dielectric polarization for barium titanate and Seignette salt, 1816. Investigation of discharge curves of dielectrics with several polarisation mechanisms, 6941. Investigation of dielectrics by means of a c.r.o., 6943. *See also* BELYAEV, I. N., 9807
NOVOSILTSEV, N. S. and KUKOZ, L. A. Time relation of the h.v. polarization in heated glass, 7831
NOWACKI, W. and SCHEIDEGGER, R. The crystallography of monoclinic, basic copper nitrates, Cu(NO$_3$)$_2$.3Cu(OH)$_2$. I, 1509
NOWICK, A. S. Variation of amplitude-dependent internal friction in single crystals of copper with frequency and temperature, 1385. Anelastic effects arising from precipitation in aluminium-zinc alloys, 7323. The production and detection of a non-equilibrium number of vacancies in a metal, 7384. A reinterpretation of experiments on intermetallic diffusion, 9740
NOYES, H. P. Properties of mesons, 3791. The production of mesons by protons on deuterons, 5746
NOYES, R. M. Wall effects in photochemically induced chain reactions, 9068
NOYES, R. M. and FOWLER, L. Mechanisms of chain termination in chlorine atom reactions, 9069
NOYES, W. A., JR *See* LUCKEY, G. W., 4291
NUCKOLLS, R. G. *See* KESSLER, M., 4268; RUEGER, L. J., 6867
NUOVO, M. *See* BARONE, A., 6814
NUSSBAUM, R. H. *See* NIJGH, G. J., 9661
NUYENS, M. and GROSJEAN, C. On the diffusion of thermal neutrons, 6477
NYE, J. F. The flow of glaciers and ice-sheets as a problem in plasticity, 7401
NYE, W. N. and TERESI, J. D. Automatic sample changer for windowless gas flow counters, 5491

OATLEY, C. W. *See* SANDER, K. F., 9524
OBERHETTINGER, F. *See* MAGNUS, W., 7121
OBERLY, J. J. *See* BURSTEIN, E., 731, 5900
OBI, S. Multiplet intensities for the lines ^1D–^3P of O III and Ne V, 9369. *See also* ISHIDZU, T., 549–51
OBLAD, A. G. *See* COOK, M. A., 4860
OCAMPO, J. *See* LORD, R. C., 4295
OCCHIALINI, G. P. S. On the identification of high energy particles in electron sensitive plates, 1556. *See also* BONETTI, A., 9902; MEULEMANS, G., 8182
O'CEALLAIGH, C. Masses and modes of decay of heavy mesons. I. κ-particles, 9721. *See also* GOTTSTEIN, K., 7954; MENON, M. G. K., 7941
O'CEALLAIGH, C. and ROCHAT, O. Observations on the multiple scattering of ionizing particles in photographic emulsions. III. Statistics of the sampling distributions of second differences and the technique of overlapping cells, 9231
O'CONNEL, D. J. *See* BRADNER, H., 633
O'CONNOR, D. T. *See* CRISCOULO, E. L., 390
ODA, M. *See also* WADA, Y., 1671, 2431, 2464
ODA, M. and TAKAKURA, T. A study of the solar noise at 3 300 m.c., 8451
ODA, Y. A note on the capture of fast neutrons by atomic nuclei, 6464. *See also* KIKUCHI, S., 4727
ODA, Y., SANADA, J. and YAMABE, S. On the angular distribution of 3·1-MeV neutrons scattered by protons, 2068. On the neutron-proton interaction. I, 6034, 9001
ODDIE, T. H. Dosage from radioisotopes uniformly distributed within a sphere, 7202
ODELEVSKIĬ, V. I. The relation between compressibility and resonant frequency of polarization oscillations in an ionic crystal, 2162. On the paper "On Onsager's theory of polarization of dipole liquids," 7832. On the papers of S. K. Kulkarni Dzhatkar (Jatkar) (*et al*) on the theory of polarization of dielectrics, 9446
O'DELL, F. W. *See* SHAPIRO, M. M., 8014
ODYNETS, L. L. Optical method of measuring the dielectric permeability and loss of solid dielectrics in the centimetre range, 301
OEHME, R. Production of photons in the collision of nucleons, 7286
OETJEN, R. A. and ROESS, L. C. Designs of photometer units for infrared spectrographs, 5232
OERTEL, A. C. Background correction in spectrochemical analysis and effects of scattered light in the densitometer, 3183
OFFICER, V. C. Relative arrival times of air shower particles, 7999
OFFICIER, C. B., JR. Normal mode propagation in three layered liquid half-space by ray theory, 6605
OFFNER, A. and DECKER, W. B. An $f:1\cdot0$ camera for astronomical spectroscopy, 5008
OGATA, K. and MATSUDA, H. The mass-differences C^{12}(H^1)$_4$–O^{16}, C^{12}(H^1)$_2$–N^{14}, and C^{12}(H^1)$_3$–N^{15} 8151
OGAWA, S. On the positive excess of the hard component in cosmic-ray, 409. The determination of the multiplicity of the spectrum of the meson produced by the nucleon-nucleon collisions, 410. *See also* HIRONE, T., 8046–7; MIURA, S., 8824; YAMADA, E., 8219
OGAWA, S. and MIURA, S. On the effect of the γ-ray to the cosmic ray underground, 5540
OGAWA, S. and NAGAHARA, Y. On the East-West effect of the cosmic-radiation in the upper atmosphere, 448
OGAWA, S. and YAMADA, E. On the production of γ-rays accompanied by the absorption of π-meson by a proton, 642. On the production of γ-rays accompanied with the absorption of π-mesons by a proton. I, 5724
OGAWA, S., YAMADA, E. and NAGAHARA, Y. On the absorption of the negative π-meson by deuteron, 7547. *See* LEVINTHAL, E. C., 7098

Ogg, R. A., Jr. *See* Newman, R., 4156

Ogle, K. N. On the resolving power of the human eye, 8393

Ogle, W. E. *See also* McElhinney, J., 4719

Ogle, W. E. and McElhinney, J. The resonance photofission cross section for U^{238}, 4720

Ogston, A. G. *See* Fessler, J. H., 9098

Oguchi, T. The propagation of order in the simple cubic lattice, 2822. Statistics of the three-dimensional ferromagnet. II, 5550; III, 5551. *See also* Takagi, Y., 6493–4

Ogura, I. Etching cavities and figures on single crystals of magnesium, 9128

Ohkawa, T. A proposal on the measurement of the recoil spectrum using gas source, 9670

Oikawa, T. *See* Motokawa, K., 7427

Oka, S. and Nakada, O. On the dielectric loss in polydisperse polar polymers, 8723

Okabayashi, H. *See* Yasumi, M., 6953

Okabayashi, T. *See* Fujimoto, Y., 5118

Okada, J. *See* Miyazawa, H., 5446; Mizushima, S., 5350

Okamoto, A. H. *See* Levine, S. W., 8329

Okamura, T. Ferromagnetic resonance absorption and a new transition in $NiOFe_2O_3$ at low temperature, 8840

Okamura, T. and Simoizaka, J. On the reaction kinetics of spinel-type ferrite. I. Nickel ferrite, 8032. A new magnetic transition of Mn-ferrite, 8033

Okamura, T. and Torizuka, Y. Research on the specific heat and the Hall effect of magnetite, 4526. *g*-Factors of binary ferrites at low temperature, 7082. Microwave resonance absorption in semi-conductor. II. Magnetite single crystal, 8027. Ferromagnetic resonance absorption in $MnOFe_2O_3$ at low temperatures, 8841

Okamura, T., Torizuka, Y. and Kojima, Y. Microwave resonance absorption of $NiOF_2O_3$, 3628. Magnetic resonance absorption in anti-ferromagnetic materials, 5564. Microwave resonance absorption in ferromagnetic semi-conductor. I. Nickel ferrite, 8026

Okawara, R. *See* Murata, H., 976

Okazaki, A. Faraday effect of strong electrolytes in aqueous solutions. IX. The temperature dependence of the molecular rotation constants. I, 8863

Okazaki, C. *See also* Watanabe, T., 1508

Okazaki, C. and Suita, T. Electric conduction in ionic crystals. I, 8728

Oke, J. B. A theoretical Hertzsprung–Russel diagram for red dwarf stars, 46

O'Kelley, G. D. *See also* Hyde, E. K., 7214; Orth, D. A., 6420

O'Kelley, G. D., Barton, G. W., Jr, Crane, W. W. T. and Perlman, I. The radioactivity of Am^{242}, 1992

Oketani, S. *See* Trillat, J.-J., 3080, 5823

Okrent, D. and Solomon, A. K. On the sensitivity of photographic grains to electrons, 8779

Oksengorn, B. *See* Robin, S., 1745

Ōkubo, H. On the endurance limit of a round bar with longitudinal grooves, 687

Oldenberg, O. *See* Broida, H. P., 4827

Oldham, M. S., Mundie, L. G., Matossi, F. and Cheydleur, B. F. A method for the determination of optical constants of semi-transparent films, 987

Oldroyd, J. G. Rectilinear flow of non-Bingham plastic solids and non-Newtonian viscous liquids. II, 5828. The motion of an elastico-viscous liquid contained between coaxial cylinders. I, 9298

Oldroyd, J. G., Strawbridge, D. J. and Toms, B. A. A coaxial-cylinder elastoviscometer, 3359

Oleksa, S. *See* Critchfield, C. L., 4603

Oliver, D. S. *See* Frank, F. C., 8333

Oliver, R. An integrating X-ray dosemeter, reading directly in skin dose, 5453

Ollano, Z. M. I. and Roy, R. R. Emission of neutrons and protons from Ne^{22} by the bombardment of α-particles, 3761

Ollom, J. F. and van Vleck, J. G. On the splitting of the ground state of Ni^{++} in $Ni\,SiF_6.6H_2O$, 7190

Olsen, H. and Wergeland, H. On the light from sychrontron beams, 9539

Olsen, J. L. *See* Mendelssohn, K., 326, 2705

Olsen, M. Superconductivity of lead isotopes, 9491

Olson, J. M. *See* Duckworth, H. E., 4618, 8909

Olson, N. Mathematical analysis of an acoustic filter 162

Olsson, O. *See* Vestin, R., 3388–9

Olsson, P. O. Neutron-proton scattering with repulsive forces, 9004

Olver, F. W. J. A new method for the evaluation of zeros of Bessel functions and of other solutions of second-order differential equations, 6

O'Meara, F. E. Gamma-spectrum of Ta^{182}, 1289. Circuits and tubes for ultra-sensitive electrometers 4373

Om Parkash. On the temperature dependence of counter characteristics in self-quenching G–M counters, 1120. On the temperature variations in alcohol-argon filled G–M counters, 1877. Fine structure in the east-west cosmic-ray intensity at Lahore ($\lambda = 22°$ N), India. I, 5534

Om Prakash, Lal, S. and Singh, B. Radiation correction and the law of cooling, 2604

Ondrejcin, J. J. *See* Wall, F. T., 1462

Ôneda, S. *See* Ozaki, S., 84

O'Neill, G. F. and Scott, W. T. On range-momentum measurements for electrons in gases, 2729

Ong Ping Hok. *See* Heerschap, M., 2966; Stoker, P. H., 7229

Ono, K. On the spin of neutrino, 8938. *See also* Kumagai, H., 7097, 9600; Nakumura, S., 5115; Taketani, M., 6389

Ono, N. *See* Matsuda, K., 1653

Ono, S. Statistical thermodynamics of multimolecular adsorption. I, 2144. Statistical thermodynamics of critical and surface phenomena. III. A theory of lower critical solution phenomenon, 3154. Cluster integrals and the Thiele semi-invariants, 5156. Integral equations between distribution functions of molecules, 5643. Statistical mechanics of adsorption from multicomponent systems. I, 5879

Ôno, Y. On the anomalous magnetic moment of meson, 5117. *See also* Sugawara, M., 3333

Ôno, Y. and Sugawara, M. On the D-function of non-local fields, 5072. Behaviour of *D*-function in Yukawa's non-local field theory, 8500

Onogi, S. *See* Horio, M., 7316–18

Oosterkamp, W. J. The application of Geiger counters in X-ray diffraction, 4415

Opechowski, W. *See also* Darby, E. K., 8935

Opechowski, W. and Bryan, J. M. Statistics of a linear paramagnetic macromolecule, 8038

Öpik, E. J. Collision probabilities with the planets and the distribution of interplanetary matter, 6681. Stellar models with variable composition. II. Sequences of models with energy generation proportional to the fifteenth power of temperature, 6711. Transport of heat and matter by convection in stars, 9249

Opler, A. Calculation of the Raman shift in vacuum, 5300

Opolski, A. Some remarks on the distribution of space velocities and kinetic energy on the Hertzsprung–Russell diagram, 5045

Ore, A. Diverging potentials and the virial theorem, 4117; Erratum, 6042. The existence of Wheeler-compounds, 8113

Orgel, L. E., Cottrell, T. L., Dick, W. and Sutton, L. E. The calculation of the electric dipole moments of some conjugated heterocyclic compounds, 4583

Oriani, R. A. Local order in solid Cu_3Au, 1356. The entropies of melting metals, 4336

Oriol Cardús, J. On the phase-law in earth currents, 3224. *See also* Romañá, A., 6609

Orlin, J. J. *See* Gibson, W. M., 5775

Orlov, A. Ya. Movement of the pole of the earth from 1939 to 1949, 7497

Ormestad, H. On sound absorption by vibrating plates, 9349. Experiments with sound absorption by damped vibrating plates, 9350

O'Rourke, R. C. Three-dimensional photoelasticity, 6903

O'Rourke, R. C. and Saenz, A. W. Quenching stresses in transparent isotropic media and the photoelastic method, 3815

Orr, C., Jr. *See* Dallavalle, J. M., 9079

Orth, D. A. and O'Kelley, G. D. Decay of Np^{236}, 6420

Osada, K. The ultraviolet absorption spectra of glasses, 8637

Ōsawa, K. A note on the problem of the stellar envelopes and the central condensation of the stars, 8475

Osberghaus, O. The isotope abundances of boron. Mass spectrometric analysis of the electron collision products of BF_3 and BCl_3, 1257

Osborn, R. K. *See also* Foldy, L. L., 4673

Osborn, R. K. and Foldy, L. L. The phenomenological theory of exchange current in nuclei, 85

Osborne, D. V. Second sound in liquid helium II, 2631. *See also* Atkins, K. R., 1017

Osborne, D. W. *See also* Abraham, B. M., 1805

Osborne, D. W., Abraham, B. M. and Weinstock, B. Solidification of He^3, 5359

Osborne, L. S. High energy cosmic-ray showers in nuclear emulsions, 3611

Osborne, M. F. M. The perfect diamagnetism of free electrons with application to superconductivity, 3532

Osen, J. L. *See* Allen, W. D., 1851

Osherovich, A. L. *See* Rodionov, S. F., 6282

Oshima, K. *See* Makishima, S., 4226

Oster, G. Scattering of visible light and X-rays by solutions of proteins, 6655. *See also* Horn, P., 5332

Oswatitsch, K. The velocity distribution round a symmetrical profile on the basis of local supersonic regions, 3397. Similarity laws of hypersonic flows, 8580

Oszy, A. J. The excitation spectra of some tungstates, 5303

Otomo, G. *See* Masumoto, H., 8034

Ôtsubo, A. A. *See* Haseda, T., 4351; Kanda, E., 4160

Ott, H. The ground-wave of a transmitter, 8859

Otte, J. W. The danger of, and protection from, radioactivity, 8398

Ottewill, R. H. and Jones, D. C. Adsorption of insoluble vapours on a water surface, 1455

Ouang, T.-T. *See* Montel, E., 6288

Ouellet, C. *See* Watson, J. H. L., 1461

Oughton, B. M. *See* Brindley, G. W., 1485

Oura, H. On the rate of nucleation of ice, 2214

Ourom, L. *See* Wu, T.-Y., 1252

Overbeck, C. J. American experimental physics—trends in method and technique, 8489

Overdijk, S. D. J. *See* Michels, A., 9447

Overgage, E. *See* Maxted, E. B., 1424

Ovey, C. D. On the interpretation of climatic variations as revealed by a study of samples from an equatorial Atlantic deep-sea core, 4935

Owe Berg, T. G. On ferromagnetism, paramagnetism and cohesive energy of transition metals and their alloys, 7069

Owen, B. G. A magnetic cosmic-ray spectrograph with counter recording. II. The electronic and recording system, 440

Owen, B. G. and Wilson, J. G. Further measurements of the charge ratio of μ-mesons at sea level, 5519. *See also* Hyams, B. D., 439

Owen, D. An apparatus for studying the laws of the magnetic field due to an electric current in a long straight conductor, 2843

Owen, E. A. and Liu, Y. H. Recovery and recrystallization in highly stressed pure aluminium, 6513

Owen, G. E. *See also* Cook, C. S., 2014

Owen, G. E., Neiler, J. and Ray, W. A comparison of the experimental and computed fast neutron efficiencies of a scintillation counter, 7969

Owen, J. *See* Griffiths, J. H. E., 7096

Owen, J. D. *See* Davies, R. M., 3126

Owen, L. E. Chamber for controlled atmosphere spectral excitation, 4234

Owen, R. B. and Sayle, E. A. Scintillation counting equipments, 4471

Owen, T. B. *See also* Hoard, J. L., 9173

Owen, T. B. and Hoard, J. L. The structure of octachlorocyclobutane, C_4Cl_8, 3943

Owston, P. G. Measurement of diffuse scattering and scattering by hydrogen atoms, 2722

Oxholm, M. L. *See* Shaw, J. H., 5034

Oyama, S. On the vapour flow in the diffusion pump, 883. *See also* Muto, T., 5626, 8083

Ozaki, S. On the decay of a heavy meson into lighter mesons, 635. A study on ion source of low voltage arc type, 6272

Ozaki, S., Ôneda, S. and Sasaki, S. On the new mode of interaction between spinor fields, 84

Ozawa, Y. Theory and experiments of frequency-selective heating in heterogeneous dielectrics, 4371

Ozols, J. Modifications of bismuthyl nitrate, $BiONO_3.H_2O$, 6586

Pac, P. Y. *See* Enatsu, H., 8522

Pacault, A. Diamagnetic properties of silicones, 5585. *See also* Pascal, P., 7714

Pacault, A., Hoarau, J. and Joussot-Dubien, J. The form of pole pieces for the measurement of magnetic susceptibilities, 8017

Pachner, J. On the acoustical radiation of an emitter vibrating in an infinite wall, 5195. On the acoustical radiation of an emitter vibrating freely or in a wall of finite dimensions, 5196, 6807

Pack, D. C. *See also* Evans, W. M., 5139

Pack, D. C. and Evans, W. M. Penetration by high-velocity ("Munroe") jets. I, 5138

Pack, D. H. *See* Cook, M. A., 4860

Packard, M. E. *See* Arnold, J. T., 5663

Packer, D. M. and Lock, C. The brightness and polarization of the daylight sky at altitudes of 18 000 to 38 000 feet above sea level, 7419

Padmanabhan, V. M. Raman spectra of crystalline tartrates. IV. Sodium ammonium tartrate, 983

Paetzold, H. K. The influence of temperature and pressure on the electronic term values in crystals, 4246. A determination of the vertical distribution of atmospheric ozone by the aid of lunar eclipses, 4918

Paffett, J. A. H. Models in marine stress analysis problems, 100

Paganelli, M. and Quareni, G. On the connection between K-capture and γ-emission in potassium 40, 9678

Page, L. A. Electron-electron scattering from 0·6 to 1·7 MeV, 6260

Page, N. *See* Goldsack, S. J., 6467

Page, T. *See also* Greenstein, J. L., 7479

Page, T. and Greenstein, J. L. Ionized hydrogen regions in planetary nebulae, 7478

Pahl, M., Hiby, J., Smits, F. and Gentner, W. Mass spectrometer measurements on argon from potassium salts, 561

Pai, M. U. *See* Barnard, A. J., 9758

Painter, C. L. *See* Wall, F. T., 5892

Pais, A. *See* Case, K. M., 852; Jost, R., 6747

Pajares, E. *See* Torroja, J. M., 3200

Pake, G. E. Fundamentals of nuclear magnetic resonance absorption. I, 1972; II, 1973. *See also* Schuster, N. A., 3703, 5635

Pakswer, S. *See also* Amdursky, M. E., 6222

Pakswer, S. and Reed, W. O. Photoconductivity of composite photoemissive cathodes, 7896

Palacios, J. Revision of the fundamentals of electrochemistry, 3133

Palatnik, L. S. X-ray investigation of the transformations in a surface layer of a metal under the action of electric discharges, 8249. Quantitative formulation of crystal-geometrical congruence, 9817

Palilla, F. *See* Bastian, R., 9107

Palit, S. R. and Venkateswarlu, V. Solubilization of water in non-polar solvents by cationic detergents, 8563

Palm, J. H. The theoretical basis and interpretation of the Schnadt notch test, 4799

Palmer, H. B. *See* Curtiss, C. F., 6939

Palmer, H. P. "Physics of clouds and precipitation" (disc), 4942. *See also* Brewer, A. W., 9420

Palmer, P. J. Models in aeronautical stress analysis problems, 100

Palmer, P. L. *See* Fox, L. L., 895

Palubinskas, F. S. *See* Lufcy, C. W., 4590

Palumbo, D. Diffusion coefficient of electrons in a gas, 1863

Panasenkov, N. S. Influence of the turbulence of a jet of liquid on its atomization, 8550

Panceram, A. Investigation of the airborne sound insulation by single and double walls, 5220

Pancini, E. *See* Lepri, F., 3245; Mezzetti, L., 4504; Quaranta, A. A., 9545

Paneth, F. A. Radioactive standards and units, 7199, *See* Chackett, K. F., 9846

Paneth, H. R. The mechanism of self-diffusion in alkali metals, 2080

Panin, B. *See* Biberman, L., 6245

Pannetier, G. Two new sequences of the system $3\pi \rightarrow 3\Sigma$ of the NH radical observed in the explosive decomposition of hydrazoic acid, N_3H, 4828. Chemiluminescence of the explosive decomposition of chlorine azide N_3Cl and nitrogen chloride NCl_3. Mechanisms of these reactions, 8655

Pannetier, G. and Gaydon, A. G. Contribution to the study of the free radical NH; experimental value for its energy of dissociation, 6846

Panofsky, W. K. H. *See also* Aamodt, R. L., 2023, 9724

Panofsky, W. K. H., Aamodt, R. L. and Hadley, J. The gamma-ray spectrum resulting from capture of negative π-mesons in hydrogen and deuterium, 4691

Panofsky, W. K. H., Aamodt, L., Hadley, J. and Phillips, R. The γ-ray spectrum resulting from capture of negative π-mesons in hydrogen, 1300

Pant, L. M. *See* Saksena, B. D., 1513, 4289

Pantchechnikoff, J. I. On the nature of a soldered contact on a semiconductor, 1052

Paolucci, A. A. *See* Petrocelli, J. V., 8296

Papapetrou, A. Equations of motion in general relativity. I, 2361; II. The coordinate condition, 3317. Landau diamagnetism and Meissner effect, 2707. Spinning test-particles in general relativity. I, 9259. *See also* Corinaldesi, E., 9260

Papapetrou, A. and Schrödinger, E. The point-charge in the non-symmetric field theory, 7504

Papas, C. H. *See* Levine, H., 2860

Papineau, A. Factors affecting the stability of Geiger–Müller counters with thin end windows (bell counters with an argon-alcohol filling), 9542

Papineau, L. *See* Berthelot, A., 3738

Papkow, A. *See* Ritter, O., 7939

Papp, G. *See* Bay, Z., 6406

Paranjpe, M. M. and Shingre, M. V. The scattering of light by liquid droplets of different refractive indices, 7785

Parenago, P. P. A study of the space motions of the stars, 39. On the gravitational potential of the galaxy, 6000. *See also* Masevich, A. G., 6002

Parenago, P. P. and Masevich, A. G. Investigation of the mass-luminosity-radius relation, 52

Paris, R.-A. *See* Cochet-Muchy, B., 8320

Park, J. D. *See* Scruby, R. E., 4280

Parkash Om. *See* Om Parkash

Parker, R. A study of the magneto-resistance of silicon-iron, 1954. The saturation magneto-resistance of ferromagnetic alloys, 6371

Parker, R. C. and Hatch, D. Frictional relaxation oscillations, 1384

Parker, R. C. and Whittaker, E. J. W. The friction and mechanical properties of powders bonded by synthetic resins, 3828

Parker, W. G. *See* Wolfhard, H. G., 260

Parkhomovskiĭ, G. D. *See* Lifshits, I. M., 1669

Parkin, P. H. *See also* Allen, W. A., 7647

Parkin, P. H. and Scholes, W. E. Recent developments in speech reinforcement systems, 3421

Parkins, W. E., Dienes, G. J. and Brown, F. W. Pulse-annealing for the study of relaxation processes in solids, 8272

Parkinson, D. The reinforcement of rubber by carbon black, 9754

Parkinson, D. H., Simon, F. E. and Spedding, F. H. The atomic heats of the rare-earth elements, 6395

Parkinson, W. D. Review of the literature on the ion balance of the lower atmosphere since 1939, 4951. The formation of molecular helium in a glow discharge, 8623

Parodi, M. On the calculation of characteristic frequencies of alternating cyclic chains, 1220

Parr, R. G. LCAO molecular orbital scheme and theoretical resonance energies, 7168

Parr, R. G., Craig, D. P. and Ross, I. G. Molecular orbital calculations of the lower excited electronic levels of benzene, configuration interaction included, 2901

Parr, R. G. and Mulliken, R. S. LCAO self-consistent field calculation of the π-electron energy levels of *cis*- and *trans*-1,3-butadiene, 1215

Parr, R. G. and Taylor, G. R. LCAO self-consistent field calculation of the twisting frequency and π-electron energy levels of allene, 4588

Parrish, W. The manufacture of quartz oscillator-plates. III. Lapping and final frequency adjustment of the blanks, 2676

Parry, G. S. The crystal structure of hydrate racemic acid, 3941

Parry, J. K. *See* Caro, D. E., 5516

Parsons, B. G. *See* Harvey, B. G., 4641

Parsons, P. L. *See* Bechmann, R., 7844

Parthasarathy, S. Light scattering in gases, 7784

Parthasarathy, S., Srinivasan, D. and Chari, S. S. Absorption of ultrasonics in liquids from thermal considerations, 1675

Parzen, G. On the scattering theory of the Dirac equation, 1106. Scattering of 100-Mev electrons from a heavy nucleus, 1869. Radiative processes in the presence of heavy nuclei, 4096

Parzen, P. and Goldstein, L. Effect of hydrostatic pressure in an electron beam on the operation of traveling-wave devices, 4553. Current fluctuations in the direct-current gas discharge plasma, 5435

Pascal, P., Duval, C., Lecomte, J. and Pacault, A. Contribution to the study of the structure of the persulphuric ion (magnetochemistry and infra-red absorption), 7714

Pashler, P. E. *See* Welsh, H. L., 4278

Paskin, A. *See* Keller, J. M., 365

Päsler, M. *See* Kallmann, H., 857

Passman, S. *See also* Block, M. M., 7292

Passman, S., Block, M. M. and Havens, W. W., Jr. Analysis of charged meson production by protons, 7293

Pasternack, S. and Snyder, H. S. High energy neutron scattering by nuclei, 3033

Pasternak, R. A. The crystal structure of a pentachlorocyclohexene, $C_6H_5Cl_5$, 9163

Pastor, R. C. *See* Hutchinson, C. A., Jr, 4530

Pasynokov, R. E. *See* Smolenskiĭ, G. A., 9438

Paterson, S. A discussion on detonation: the reduction in reaction energy in cases of incomplete confinement, 3121. Source of the light recorded in photographs of detonating explosives, 6524. *See also* Cottrell, T. L., 5129, 8873

Paton, J. Aurora and luminous night clouds, 2233

Patrick, W. A. and Littler, C. L. Method of measuring the absolute potential of aqueous half-cells, 2129

Patrushev, V. L. The application of the method of curvilinear coordinates to calculation of the π-mode end-space resonator, 2848

Patter, D. M. Van. *See* Van Patter, D. M.

Patterson, C. *See* Inghram, M. G., 3730

Patterson, D. *See* Dunning, W. J., 3365, 9027

Patterson, G. D., Jr and Mellon, M. G. Automatic operations in analytical chemistry, 3884

Paul, E. *See* Langevin, A., 2878

Paul, M. Contribution to the problem of solar influence on geophysical events, 2191

Paul, W. *See also* Friedburg, H., 7287

Paul, W., Jones, D. A. and Jones, R. V. Infra-red transmission of galena, 6858

Pauli, J. and Süe, P. The crystallization of solutions of potassium and of strontium nitrate followed by means of radiostrontium as indicator, 3387

Pauli, R. T. *See also* Mileikowsky, C., 609

Pauli, R. T. and Mileikowsky, C. Thin-target yield of $^{15}N(p, \alpha)^{12}C$, 3004

Pauli, W. On the connection between spin and statistics, 5076

Pauling, L. Electron transfer in intermetallic compounds, 1958. Interatomic distances in Co_2Al_9, 3927. Quantum theory and chemistry, 4079. *See also* Vaughan, P. A., 2907

Pauly, J. Spatial distribution of traces of strontium in a potassium nitrate crystal, 8336

Pauthenet, R. and Bochirol, L. Spontaneous magnetization of ferrites, 6340

Pauthenier, M. Electrical coalescence of fog and cloud, 4941

Pauthenier, M. and Loutfoullah, N. The electric scavenging of clouds, 1544

Pavalow, M. *See* Staker, W. P., 5535

Pavlenko, A. M. *See* Lyashenko, V. I., 1838

Pavlov, V. *See* Murin, A., 6451

Pavlov, V. A. and Yakutovich, M. V. The nature of the "viscous" fracture, 6487*

Pawsey, J. L. Solar radio-frequency radiation, 32. The use of radio waves for astronomical observations, 792
Payne, H. E. *See* Fry, D. W., 1094
Payne, P. R. *See* White, D. F., 1468
Payne, R. M. *See* Gibson, W. M., 9538
Payne-Scott, R. *See* Christiansen, W. N., 5026
Peach, M. and Koehler, J. S. The forces exerted on dislocations and the stress fields produced by them, 2094
Peard, M. G. and Cullis, C. F. A periodic chemical reaction. The reaction between hydrogen peroxide and iodic acid, 9044
Pearlstein, E. A. and Sutton, R. B. Mobility of electrons and holes in diamond, 389
Pearse, R. W. B. Fundamental research in molecular spectra, 5260
Pearse, R. W. B. and Gaydon, A. G. The identification of molecular spectra, 186
Pearson, G. L. *See also* Brattain, W. H., 2687; Goucher, F. S., 4380; Hall, H. H., 9477
Pearson, G. L. and Suhl, H. The magneto-resistance effect in oriented single crystals of germanium, 7910
Pearson, H. A. *See* Carlisle, R. W., 5216
Pease, R. L. and Feshbach, H. Binding energy of the triton, 3697
Peaslee, D. C. Second order current corrections for boson fields, 74. Boson current corrections to second order, 2371. Infinite integrals in quantum electrodynamics, 2372. Absolute selection rules for meson decay, 3039; Erratum, 9715. *See also* Blaser, J.-P., 3763
Pecjak, F. A. *See* Sun, K-H., 5755, 6457*
Peck, G. T. *See* Chesterman, W. D., 4026, 9904
Pecker, C. The equilibrium of the convection zone in stellar atmospheres, 5052. Atmospheres possessing a convection zone in adiabatic equilibrium, 5053. The connection between the adiabatic and radioactive zones in stellar atmospheres, 6006. *See also* Laffineur, M., 2719
Pecker, J.-C. Colour temperature of B-stars, 817. The inversion of Laplace's relation, 1581. Contribution to the theory of spectral type. I. General introduction: the construction of model atmospheres, 1588; II. The polarization by free electrons and spectral type, 1589; III. Construction of models for B-type stars, 7486; IV. The formation of lines in stellar spectra, 7487; V. The "blanketing effect" and the structure of the solar photosphere, 7488. Nuclear moments and the structure of the nucleus, 8898. *See also* de Jager, C., 6694
Pecker, J.-C. and de Jager, C. Equivalent widths of solar lines and microturbulence, 6695
Peckham, R. H. Visual acuity through various types and grades of sun glasses, 4961
Pederson, C. N. *See* Raeth, C. H., 7967
Peebles, G. H. and Plesset, M. S. Transmission of gamma-rays through large thicknesses of heavy materials, 4675
Peebles, W. C. *See* Hofer, L. J. E., 8331
Peek, H. M. and Hill, T. L. On lattice theories of the liquid state, 115
Peelle, R. W. *See* Franzen, W., 391
Peerdeman, A. F. *See also* Bijvoet, J. M., 9161
Peerdeman, A. F., van Bommel, A. J. and Bijvoet, J. M. Determination of absolute configuration of optical active compounds by means of X-rays, 9160
Peirson, D. H. The background counting rate in a Geiger–Müller counter, 7028
Peirson, D. H. and Franklin, E. Aerial prospecting for radioactive minerals, 9844
Peiser, A. M. *See* Golden, S., 9762
Pekeris, C. L. The zero-point energy of helium, 264
Pekerman, F. M. *See* Kalinichenko, I. I., 8647
Pell, E. M. *See* Tomboulian, D. H., 8761
Pelzer, H. The effective mass of a charged sphere moving slowly in a polarizable dielectric, 3504. Energy density of monochromatic radiation in a dispersive medium, 8070. *See also* Gross, B., 8273
Pendlebury, E. D. *See* Corner, J., 8308
Penfield, R. *See* Bergmann, P. G., 847
Penfold, A. S. Apparent error in the measured mass of S^{32}, 1256. *See also* Katz, L., 4724, 7272
Peng, H. W. *See also* Chang, C.-H., 4595; King, S.-N., 4594
Peng, H. W. and Tang, M. Y. On the binding energies of the atomic nuclei ^{2}H, ^{3}H, ^{3}He and ^{4}He. I, 4593
Penman, H. L. The role of vegetation in meteorology, soil mechanics and hydrology, 7416
Penman, R. R. *See* Eppelsheimer, D. S., 2606, 3209
Penner, S. S. A two-path method for measuring flame temperatures and concentrations in low pressure combustion chambers, 4340. Thermodynamics and chemical kinetics of one-dimensional nonviscous flow through a Laval nozzle, 6772. *See also* Weber, D., 7690
Penner, S. S. and Weber, D. Quantitative infrared intensity measurements. I. Carbon monoxide pressurized with infrared-inactive gases, 6873; II. Studies on the first overtone of unpressurized CO, 6874. Emission of radiation from diatomic gases. II. Experimental determination of effective average absorption coefficients of CO, 9382
Penney, W. G. A discussion on detonation: introduction to the discussion, 3118
Penney, W. G. and Pike, H. H. Shock waves and the propagation of finite pulses in fluids, 151
Pennington, R. E. and Kobe, K. A. Numerical integration as a labor-saving device in the compilation of thermodynamic properties of polyatomic molecules, 5376
Pennycuick, K. Effect of cross-wind on a projectile, 7575
Pepinsky, R. *See also* Drenck, K., 7931
Pepinsky, R. and MacGillavry, C. H. Phase-limiting relations following from a known maximum value of the electron density, 7388
Pepper, T. P. *See* Allen, K. W., 5759
Peppiatt, H. J. and Brockhouse, B. N. The initial susceptibility of nickel under tension, 8080
Pereira, A. W. *See* Gokhale, G. S., 1163; Rao, A. S., 7991
Perekalina, T. *See* Galperin, F., 6353
Perez, J. P. *See* Michels, A., 9454
Perez-Mendez, V. and Lindenfeld, P. Radioactivity of F^{17}, 2947, 8162
Perkin, J. L. The fast neutron disintegration of C^{12} and B^{10}, 4739
Perkins, D. H. Emission of heavy fragments in nuclear explosions, 597. Nature of particles emitted in nuclear explosions at high energies, 601
Perkins, G. *See* Delahay, P., 9109
Perkins, J. F. and Solberg, A. W., Jr. Graphical determination of transmission curves for certain magnetic lens beta-ray spectrometers, 4442
Perley, G. A. *See* Eckfeldt, E. L., 3863
Perlman, I. Alpha radioactivity and the stability of heavy nuclei, 2007. *See also* Barton, G. W., Jr, 3750, 4655; Marquez, L., 5747; Neumann, H. M., 5688; O'Kelley, G. D., 1992
Perlman, M. L. *See also* Friedlander, G., 1274, 2984
Perlman, M. L. and Friedlander, G. Radiation from I^{126}, 5705*
Perlow, G. J. and Kissinger, C. W. A search for primary cosmic gamma-radiation. I, 4499
Perls, T. A. and Buchmann, E. A bar-magnet velocity meter, 7581
Perls, T. A. and Wildhack, W. A. A simple type of $X(t) - Y$ recorder, 7642
Pernoux, E. *See* Bernard, R., 7311
Perrelle, E. T. de la. *See* de la Perrelle, E. T.
Perrier, D. *See* Thibaud, J., 9347
Perrin, F. and Abragam, A. Polarization of light scattered by spherical particles, 5334
Perrin, F. H. and Altman, J. H. Photographic sharpness and resolving power. II. The resolving-power cameras in the Kodak research laboratory, 4979
Perron, R. R. and Wright, B. A. Alteration of collagen structure by irradiation with electrons, 2132
Perrot, M. *See* Blanc-Lapierre, A., 233, 1047, 4317, 5321, 8733–4
Perry, J. E. *See* Duncan, D. B., 7257
Perry, K. E. *See* Roberts, B. W., Jr, 1133
Perry, K. E. G. *See* Goulding, F. S., 3717
Perry, R. W. and Kantrowitz, A. The production and stability of converging shock waves, 6802
Perryman, E. C. W. and Lack, J. M. Examination of metals by polarized light, 4303
Persico, E. On the disposition of the diaphragms in helicoidal beta spectrometers, 7014

Persico, E. and Geoffrion, C. Beta-ray spectroscopes, 3561
Person, H. *See* Lossnitzer, H., 4917
Perutz, M. F. New X-ray evidence on the configuration of polypeptide chains, 8362. *See also* Bragg, L., 526; Huxley, H. E., 8362
Perutz, M. F., Jope, M. and Barer, R. Observations of proteins in polarized ultra-violet light, 7733*
Peshkin, M. Scattering and absorption of scalar and pseudoscalar-mesons by nucleons, 4102
Pessoa, E. F. and Margem, N. On a disintegration of the positive heavy meson, 6471
Pesteil, P. Fluorescence and absorption of crystalline stilbene, 9390
Petch, H. E. and Johns, M. W. Nuclear spins of the 2·62-Mev and 3·20-Mev excited states of thorium *D*, 1969
Peter, S. *See* Braune, H., 5855
Petermann, A. and Stueckelberg, E. C. G. Restriction of possible interactions in quantum electrodynamics, 6024
Petermann, L. *See* Mercier, R., 919
Peters, A. S. The effect of a floating mat on water waves, 6775
Peters, B. *See* Bradt, H. L., 2781
Peters, C. W. *See* Plyer, E. K., 5246
Peters, E. *See* Bogan, S., 5895
Peters, R. *See* Myers, V., 8092; Sugarman, N., 5764
Peterson, A. M. The mechanism of *F*-layer propagated back-scatter echoes, 8067. *See also* Manning, L. A., 763
Peterson, A. P. G. *See* Beranek, L. L., 5219
Peterson, J. M., Gilbert, W. S. and White, R. S. Photo-mesons from carbon, 5767
Peterson, R. E., Adair, R. K. and Barschall, H. H. Nuclear energy levels in lead isotopes, 627
Peterson, R. E., Barschall, H. H. and Bockelman, C. K. Investigation of nuclear energy levels in sulfur, 628
Petiau, G. On the theory of the scattering of particles of spin $\hbar/2$, 841. On the quantum theory of bremsstrahlung, 1612. On the theory of electromagnetic bremsstrahlung, 3325. On the theory of the generalized double Compton scattering, 4092. On a formalism of the theory of particles of spin O or $\hbar$ and their wave equations in external fields, 5128. On the creation of electron-positron pairs in the process of collision between particles of spin $\frac{1}{2}$, 6738. On a simplification in the calculation of the cross-sections in the process of particle collisions, 7548
Petralia, S. Ultrasonic interferometry in gases, 905. Propagation of ultrasonics in ferromagnetics, 6081
Petree, B. *See also* Bashkin, S., 5788
Petree, B., Johnson, C. H. and Miller, D. W. Disintegration of boron by fast neutrons, 8986
Petri, W. The radial distribution of the monochromatic corona emission, 5993
Petrie, R. M. The magnitude differences between the components of eighty-two spectroscopic binaries, 3288. The mass-luminosity relation determined from spectroscopic binaries, 3294
Petrie, W. Remarks on the excitation of hydrogen and helium in the upper atmosphere, 6645
Petrocelli, J. V. and Paolucci, A. A. Overvoltage at oxidation-reduction electrodes, 8296
Petropoulos, G. M. and Ampariotis, P. A. Effect of recombinations in electron avalanches, 7917
Petrow, V. *See* Géllert, E., 8633
Petrukhin, A. I., Podgoretskiĭ, M. I., Fedorov, N. D., Shtarkov, L. N. and Shcherbakova, M. N. The form of the impulse in an ionisation chamber, 387
Pétry, J. *See* Letort, M., 723, 725
Petterssen, S. Some aspects of the general circulation of the atmosphere, 4926
Pettersson, H. Radium and deep-sea chronology, 7402
Petty, C. C. *See* Curcio, J. A., 5274, 5356
Peuteman, A. A binary counter with impulse-controlled addition and subtraction, 5501
Peyrou, C. The energy distribution of cosmic ray disintegration stars, and the absorption in air of the star-producing radiation, 441. *See also* Lagarrigue, A., 9718
Peyrou, C. and Lagarrigue, A. Mass measurements on cosmic-ray particles, 3603
Peyturaux, B. The spectral-energy distribution at the centre of the solar disk between 6 700 Å and 23 000 Å, 4049. On the radiation temperature of the centre of the solar disk between 6 700 and 23 000 Å deduced from recent observations, 5027. The opacity of the solar photosphere between 6 700 Å and 23 000 Å, 7463
Pfalzner, P. M. On the flow of gases and water vapor through wood, 122. On the friction of various synthetic and natural rubbers on ice, 3106
Pfann, W. G. Significance of composition of contact point in rectifying junctions on germanium, 4382
Pfefferkorn, G. Electron microscopic investigations on calcite and its crystal habit, 3812
Pfeil, P. C. L. The constitution of uranium-molybdenum alloys, 773
Pfohl, F. W. *See* Burwell, R. L., Jr, 138
Phelps, F. P. *See* Plyler, E. K., 5266
Phibbs, M. K. Ultra-violet absorption spectra of mercury in solution, 4264
Philbert, G. A mass spectrometer source allowing the use of high gas pressures in the ionization chamber, 5484
Phillips, A. *See* Ayre, R. S., 900
Phillips, B. B., Froslie, H. M. and McFarland, R. H. An investigation of the existence of a sodium lithium molecule, 4266
Phillips, C. S. E. Dielectric relaxation of alcohol-heptane mixtures, 1820
Phillips, D. D. *See* Allred, J. C., 8189, 8972
Phillips, D. J. and Thompson, N. Surface effects in creep of cadmium crystals, 1377
Phillips, G. C. The long-range protons from the disintegration of carbon by deuterons and a study of the competing reactions, 1303. *See also* Falk, C. E., 8961; Terrell, J., 8196
Phillips, G. C., Cowie, D. B. and Heydenburg, N. P. A search for emission of electron pairs from nuclei, 9689
Phillips, G. C. and Heydenburg, N. P. Nuclear electron pairs from $F^{19}(p, \alpha)^{*}O^{16}$, 7263
Phillips, G. C. and Richardson, J. E. Preparation of carbon targets, 1347
Phillips, G. J. *See* Briggs, B. H., 767
Phillips, J. A., Lawson, J. S., Jr and Kruger, P. G. Photo-disintegration of the deuteron, 2046
Phillips, J. G. A rotational analysis of the γ-system of the TiO molecule, 7685
Phillips, R. *See* Aamodt, R. L., 9724; Panofsky, W. K. H., 1300
Phillips, R. S. The electromagnetic field produced by a helix, 4554
Phillips, S. E. *See* Colin, M., 6946
Philp, S. F. *See* Cloud, R. W., 129
Philpot, J. St. L. Local refractometry: the observation of transparent inhomogeneous matter, 6655
Philpott, D. E. Portrait shadow-casting, 7312
Philpotts, A. R. and Thain, W. Infra-red spectra of unsaturated aromatic carbinols, 2528
Phipps, T. E., Jr. *See* Kolsky, H. G., 203, 1740, 5672
Pianto, E. Del. *See* Del Pianto, E.
Piaskovskaya-Fessenkova, E. V. Special regions of the sky with respect to the scattering of light, 4949
Piatier, H. *See also* Ambrosino, G., 3700
Piatier, H. and Génin, R. The use of a frequency-modulation detector as a coincidence circuit, 2771
Picard, E., Rogozinski, A. and Surdin, M. Use of a radio link for observation of coincidences between distant counters, 4511
Piccioni, O. On the nuclear interaction of the secondary particles of the hard showers, 424. *See also* Walsh, T. G., 1917
Picciotto, E. and van Styvendael, M. Dosage and localization of lithium by a nuclear reaction in minerals, 4884
Pichat, L. and Koechlin, Y. Radioactivity measurements using non-crystalline fluorescent solids, 7035
Picht, J. The determination of a three-mirror system consisting of an (arbitrary) paraboloidal mirror and a two-mirror supplementary system, for which spherical aberration is removed and the sine condition (freedom from coma) is strictly fulfilled. Investigation into the substitution of the (deformed) auxiliary mirror by more simply produced mirror surfaces. I–IV, 7658
Pick, F. A. *See* Mack, J. E., 8141

Pick, H. The fundamental process in photography, 9895

Pick, H. and Weber, H. Change in density of KCl-crystals with the addition of bivalent ions, 1473

Pickavance, T. G. Cyclotrons, 9534. *See also* Cassels, J. M., 5743, 9537; Taylor, A. E., 3038, 5786, 8207

Pickelner, S. B. On the theory of the solar corona, 7469

Picket, E. E. and Todd, G. Suppression of line intensities by perchloric acid, 6555

Pickup, E. *See also* Voyvodic, L., 4497, 4685

Pickup, E. and Voyvodic, L. Emission of neutral radiation in cosmic-ray stars, 465. Relativistic increase in ionization of charged particles in photographic emulsions, 2278. Emission of Li$^8_3$ nuclei in cosmic ray stars, 2803. Radioactive nuclei emitted in cosmic-ray stars, 3620. Cosmic-ray nucleon-nucleon collisions in photographic emulsions, 5543. The emission of radioactive nuclei in cosmic ray stars, 8829

Piddington, J. H. The derivation of a model solar chromosphere from radio data, 34

Piddington, J. H. and Hindman, J. V. Solar radiation at a wavelength of 10 centimetres, including eclipse observations, 804

Piddington, J. H. and Minnett, H. C. Solar radiation of wavelength 1·25 centimetres, 805. Solar radio-frequency emission from localized regions at very high temperatures, 8452

Pidgeon, F. D. *See* Dodd, C. G., 9788

Piekara, A. The phenomena of molecular orientation in polar liquids and their solutions. II. Further development of the theory of dipole coupling in polar liquids, 7835

Pielemeier, W. H. Some effects of cavitation near 30 cps, 5149

Pierce, A. K. and Aller, L. H. The structure of the solar atmosphere as deduced from limb-darkening measures, 7464

Pierce, J. R. Note on stability of electron flow in the presence of positive ions, 363. Millimeter waves, 2847

Piéron, H. The problem of the brain mechanisms for the binaural functions of summation and lateral localisation, 7430

Pierrée, C. *See* Trillat, J.-J., 4787

Pierucci, O. *See* Merlin, M., 8787

Pietenpol, W. J. *p–n* Junction rectifier and photo-cell, 5417. *See also* Rogers, J. D., 6870

Pieter, T. Notes on the calculations of the entropy of molecules from spectroscopic data, 6383

Pieuchard, G. *See* Dossier, B., 5326, 7783

Pigg, J. C. *See* Cleland, J. W., 6969

Pihl, G. E. *See* Chang, S.-H., 3419

Pike, H. H. *See* Penney, W. G., 151

Pikler, A. Ophélimité and entropy, 1028

Pilling, F. D. *See* Boag, J. W., 7031

Pillow, M. E. Transition probabilities in band-systems of diatomic molecules: a modified "distortion" process for the wave functions, 9631

Pilowski, K. An empirical temperature scale fixed by the mass-luminosity relationship, 47. On the structure of the H.R. diagram [Zustandsdiagramm] of the stars, 7482

Pimentel, G. C. The bonding of trihalide and bifluoride ions by the molecular orbital method, 4867. *See also* Hrostowski, H. J., 6857; McClellan, A. L., 4034

Pimentel, G. C., Jura, G. and Grotz, L. The infrared spectra of mesitylene complexes, 5273

Pimonow, L. A high power ultrasonic siren, 3416

Pincherle, L. Energy levels of *F*-centres, 8343. Change of activation energy with impurity concentration in semiconductors, 9471

Pinching, G. D. *See also* Bates, R. G., 3134

Pinching, G. D. and Bates, R. G. First dissociation constant of succinic acid from 0° to 50°c and related thermodynamic quantities, 5860

Pines, D. *See* Bohm, D., 2652, 5379

Ping Hok Ong. *See* Ong Ping Hok

Pink, R. C. *See* McDonnell, F. R. M., 3879

Pinkel, B. *See* Hibbard, R. R., 5357

Pinney, E. On a mathematical theory of the reaction of cells to X-ray irradiation, 768. A theorem of use in wave theory, 9339

Pinsent, B. R. W. and Roughton, F. J. W. The kinetics of combination of carbon dioxide with water and hydroxide ions, 9050

Pinsker, Z. G. and Vaĭnshtein, B. K. Dynamic dispersion of electrons, 2190

Pippard, A. B. The surface energies of superconductors, 7904. *See also* Allen, W. D., 1850; Lock, J. M., 8742

Pirani, F. A. E. and Schild, A. On the quantization of Einstein's gravitational field equations, 72

Piraux, P. *See* Koenigsfeld, L., 8375

Pirenne, M. H. and Denton, E. J. Quanta and visual thresholds, 7429

Pischinger, A. Technical thermodynamics, 8706

Pistoulet, B. *See* Abadie, P., 1040

Pitkanen, P. H. *See* Furry, W. H., 6077

Pitts, A. C. Near ultraviolet absorption spectrum of liquid benzene from 2 795 to 3 560 A, 1739

Pivovar, L. I. *See* Korsunskiĭ, M. I., 8996; Markus, A. M., 8997

Placinteanu, I. I. On the process of association of elementary particles, 831

Placzek, G., Nijboer, B. R. A. and van Hove, L. Effect of short wavelength interference on neutron scattering by dense systems of heavy nuclei, 5808

Plass, G. N. *See* Strong, J., 2210

Platt, J. R. Molecular orbital predictions of organic spectra, 530. Isoconjugate spectra and variconjugate sequences, 4575. Spectroscopic moment: a parameter of substituent groups determining aromatic ultraviolet intensities, 4577. *See also* Longuet-Higgins, H. C., 531

Platt, M. *See* Moses, C., 8403

Plavec, M. I. On the determination of the age of meteor streams. II. On the mutual influences of particles in a meteor stream, 26

Plaza, L. *See* Judd, D. B., 3243

Pleskov, V. A. *See* Miller, N. B., 3141

Plesset, M. S. *See also* Epstein, P. S., 2428, 4158, 4675

Plesset, M. S. and Cohen, S. T. Scattering and absorption of gamma rays, 3746

Plessner, K. W. Hall effect in a selenium single crystal, 2875. Conductivity, Hall effect and thermo-electric power of selenium single crystals, 7878. Conductivity and Hall effect of microcrystalline selenium containing iodine impurities, 7879. *See also* Billig, E., 6204

Plewes, A. C. and Klassen, J. A study of mass transfer rates from the solid to the gas phase, 7810

Plomley, K. F. *See* Higgins, H. G., 1380

Ploquin, J. Magnetochemistry of the complexes of quadricovalent Cu^{++} and Ni^{++}, 9101

Ploquin, J. and Vergneau, C. Magnetic study of the copper and nickel salts of normal dibasic acids, 8022

Plotkin, I. R. Increase of entropy in an infinite universe, 9435

Plunkett, R. A method for the calculation of heat transfer in solids with temperature-dependent properties, 7801

Plyler, E. K. Combination bonds of ethylene [4 206–6 150 cm^{-1}], 6127. Infra-red absorption spectra of twelve substituted benzene derivatives from 15 to 40 microns, 7736. *See also* Benedict, W. S., 5283; Tilton, L. W., 175, 9362

Plyler, E. K. and Lamb, M. A. Infrared spectrum of chlorofluoromethane, 1741. Infrared spectrum of bromochlorofluoromethane, 9378

Plyler, E. K. and Peters, C. W. Wavelengths for calibration of prism spectrometers, 5246

Plyler, E. K. and Phelps, F. P. The transmittance of cesium bromide crystals, 5266

Pochapsky, T. E. and Quimby, S. L. Temperature variation of the compressibility of molten sodium, 105

Pocinki, L. S. The application of conformal transformations to ocean wave refraction problems, 3379

Pode, L. *See* Hart, R. W., 4354

Podgarnyĭ, I. M. *See* Markus, A. M., 8997

Podgoretskiĭ, M. I. The statistical interpretation of experiments on the absorption of shower particles, 5522. *See also* Barit, I. Ya., 5494; Petrukhin, A. I., 387

Podgoretskiĭ, M. I., Barchukov, A. I. and Rakitin, D. F. The density transition effect in electro-nuclear showers, 429

Podgoretskiĭ, M. I., Lyubimov, A. L., Shcherbakova, M. N. and Eĭdus, L. K. The instability of particles generating electro-nuclear showers, 2787

Podolsky, B. A problem in heat conduction, 5349

Poeverlein, H. Waves in anistropic conditions of propagation, 1667; Addendum, 5176. Effect of the Earth's magnetic field on group velocity and time of travel of radio waves in the ionosphere, 7134

Pohl, H. A. Supersensitive thermoelements, 6166. X-ray dosage, 6253. The motion and precipitation of suspensoids in divergent electric fields, 6980. Semiconducting materials. Electron traps and electron conduction in irradiated alkali halide crystals, 7863

Pohl, R. W. Fundamental and derived [physical] quantities, 8491

Pohlman, W. B., Bederson, B. and Eisinger, J. T. Determination of the ratio of the $g_J{}^2(S_{\frac{1}{2}})$ values for potassium and hydrogen. The gyromagnetic ratio of the electron, 8145

Poiani, G. A large ionization chamber for the study of cosmic radiation, 1881

Pokrovskiĭ, Ya. E. The mechanism of thermionic emission of an oxide cathode in impulse conditions, 7045

Polachek, H. *See* Seeger, R. J., 5182

Polack, A. On colour vision and its anomalies, 2246

Polisar, G. L. Synthesis of mathematical machines and real objects, 6048

Polisar, G. L. and Khasilev, V. Ya. The problems of the flux distribution in composite thermal systems and their solution on electrical models, 2603

Pollak, F. F. *See* Nicholas, J. W., 2549

Pollett, W. F. O. Elastic thixotropy, 710

Polli, S. The 8-year climatic cycle and its physical reality, 2218

Polyakov, M. V. and Zhigaĭlo, Y. V. On the mechanism of explosive burning of gaseous mixtures, 2616

Pomerance, H. Thermal neutron capture cross sections, 8208

Pomeranchuk, I. Exchange collisions of fast nucleons with deuterons, 8968. On the theory of the formation of many particles in one act, 9275. Theory of liquid He^3, 9427. *See also* Akhiezer, A., 5471

Pomeranchuk, I. Ya. *See* Berestetskiĭ, V. B., 8988

Pomerantz, M. A. An increase of the primary cosmic-ray intensity following a solar flare, 4509. Cosmic ray radiosonde and telemetering system, 5514. The absorption of cosmic radiation at high altitudes, 8003. *See also* McClure, G. W., 457

Pomeroy, D. Absorption length and collision length of hard-shower-producing radiation, 9581

Pool, M. L. *See also* Carss, W. L., 2968; Young, J. N., 9655

Pool, M. L. *See* Gum, J. R., 1995

Poole, J. H. J. The evolution of the earth's atmosphere, 6622

Poole, J. H. J. and Delaney, C. F. G. Origin of atmospheric argon and the radioactivity decay constants of potassium-40, 6623

Poole, M. J. *See* Allan, D. L., 2042–3

Pople, J. A. Molecular association in liquids. II. A theory of the structure of water, 2433. The communal entropy of dense systems, 5374. *See also* Lennard-Jones, J., 2432

Popoff, K. The Nernst heat theorem and the behaviour of the ratio of the specific heats of gases in the neighbourhood of the absolute zero, 1029. On the movement of the earth round its centre of gravity, 8482

Popova, N. V. *See* Zagyanskiĭ, I. L., 3192

Porfireva, N. N. Orientation-translation waves in molecular crystals. III. Proper frequencies and selection rules for molecular crystals, 2161

Poritsky, H. Extension of Weyl's integral for harmonic spherical waves to arbitrary wave shapes, 9613

Poritsky, H. and Weil, H. Conducting of current in a metallic pipe filled with a conducting liquid, 7893

Porreca, F. A peculiarity in the behaviour of ultrasonics in liquids, 9317

Porter, C. E. and Primakoff, H. The effect of Bohr orbit binding on negative μ-meson β-decay, 8992

Porter, F. T. *See also* Ter-Pogossian, M., 1662, 1997, 4643, 5697, 7232

Porter, F. T. and Cook, C. S. The high energy beta-spectrum of Sc^{46}, 4662

Porter, G. The absorption spectroscopy of substances of short life, 7697

Porter, J. G. Punched card machines at Hurstmonceux, 8427

Posner, A. M. *See* Alexander, A. E., 713

Poss, H. L. *See* Falk, C. E., 7036

Possel, R. de. *See* de Possel, R.

Post, B. and Hiskey, C. F. Electrokinetics of hydrogen evolution. I. Hydrogen overvoltage on mercury, 697

Post, B., Schwartz, R. S. and Fankuchen, I. An improved device for X-ray diffraction studies at low temperatures, 5912

Post, R. F. Decay time and efficiency of a liquid scintillator, 214

Post, R. F. and Schiff, L. I. Statistical limitations on the resolving time of a scintillation counter, 3588

Pote, A. J. *See* Davenport, L. L., 8781

Potier, A. Comparison of isostere structures such as CO_2 and NO_2^+, 9627

Potier, R. On the variational derivation of the general equations describing particles of arbitrary spin and multiple mass, 6030. On the wave-equations of particles of multiple masses, 6031. On the calculation of the current 4-vector in the theory of particles of arbitrary spin and multiple masses, 6032

Potter, C. A., Bushkovitch, A. V. and Rouse, A. G. Pressure broadening in the microwave spectrum of ammonia, 8640

Potter, R. K. and Steinberg, J. C. Toward the specification of speech, 1701

Potters, M. L. *See* Steenland, M. J., 5581

Pouget-Michel, C. *See* de Possel, R., 7110

Poulis, J. A. *See* Poulis, N. J., 6346; Ubbink, J., 7090

Poulis, N. J. Decomposition of the proton magnetic resonance line in paramagnetic crystals, 7094. *See also* Bloembergen, N., 3640

Poulis, N. J., van den Handel, J., Ubbink, J., Poulis, J. A. and Gorter, C. J. On antiferromagnetism in a single crystal, 6346

Poulter, S. R. C. *See* Harrison, V. G. W., 6142

Pound, G. M. and LaMer, V. K. Surface tension of small droplets as a function of size from critical supersaturation data, 5155

Pound, R. V. Nuclear electric quadrupole interactions in crystals, 548. Nuclear spin relaxation times in single crystals of LiF, 3633. *See also* Purcell, E. M., 4607; Ramsey, N. F., 4606

Powell, C. F. Nuclear transmutations produced by cosmic particles of great energy, 598. Mesons, 631. *See also* Fowler, P. H., 9722

Powell, H. M. Structure of clathrate compounds, 9095. *See also* Wallwork, S. C., 8363

Powell, R. E. *See also* Jura, G., 4861

Powell, R. E., Gilman, T. S. and Hildebrand, J. H. Crystallization velocity of liquid phosphorus, 8337

Powell, R. E. and Latimer, W. M. The entropy of aqueous solutes, 8566

Powell, R. W. Gallium anisotropy and crystal structure, 2163

Powell, W. M., Hartsough, W. and Hill, M. The X-ray spectrum produced by 322-MeV electrons striking a platinum target, 3551

Power, E. A. *See* Gunn, J. C., 4748, 5126

Powles, J. G. The interpretation of dielectric measurements using the Cole–Cole plot, 2669

Powling, J. *See* Bernstein, H. J., 4260

Pozefsky, A. *See* Coggeshall, N. D., 7738

Prager, S. The calculation of diffusion coefficients from sorption data, 8244

Prakash Om. *See* Om Prakash

Prakash, S. Solution of generalized wave equations of order higher than 2, 782

Prasad, K. V. K. On the determination of complex dielectric constant of medium loss substances in the microwave region, 6948

Prasad, M. and Chhaya, B. N. The time of setting of gels formed by the mutual interaction of oppositely charged sols at different temperatures, 1442

Prasad, M., Dharmatti, S. S., Kanekar, C. R. and Datar, M. G. Magnetic study of some silver salts, 489

Prasad, M., Kanekar, C. R. and Kamat, L. S. Magnetic study of some hydrates of boron compounds, 6327

Prasad, M. and Mulay, L. N. Magnetic study of some organo-metallic compounds of arsenic, 8024

Pratelli, A. M. On the e.m. field "orthogonal" in space-time. I, 3646; II, 5593

Pratt, A. W. *See also* Eden, M., 1357

Pratt, A. W., Burr, B. E., Eden, M. and Lorenz, E. An application of mass spectrometer analysis to the study of respiratory metabolism, 9864

Pratt, A. W., Collins, B. G., Lacy, R. E. and Spink, E. W. Some meteorological instruments used in building research, 2195, 9191

Pratt, J. N. and Raynor, G. V. Intermetallic compounds in ternary aluminium-rich alloys containing transitional metals, 2267

Pratt, W. W. The disintegration of Hf^{181}, 1991

Pratt, W. W., Boley, F. I. and Nichols, R. T. Ring focusing in a thin lens beta-ray spectrometer, 4440

Prégel, B. On the mechanism of phosphorescence in compounds of variable composition, 215. Separation of spectra in adjacent surface layers of phosphorescent bodies of variable composition, 966. Molecular structure of peripheral layers of phosphors, 3452. On a new phenomenon observed at the time of excitation of phosphorescent bodies with several activators, 3453

Preiswerk, P. *See* Medicus, H. A., 3720

Prentki, J. On the production of π-mesons in nucleon-nucleon collisions (pseudoscalar theory), 3338. On the production of π-mesons in nucleon-nucleon collisions (scalar theory), 5123. On the production of π^+ mesons in proton-proton collisions (case of deuteron creation), 5745. *See also* Benoist-Gueutal, P., 1317; Jean, M., 1617

Present, R. D. Note on the Li^7 quadrupole moment, 1245

Press, F. and Ewing, M. Theory of air-coupled flexural waves, 6793

Pressesky, A. J. *See* Hurst, D. G., 646

Pressly, E. C. *See* Newell, H. E., Jr, 2764

Preston, F. W. Errata: The mechanical properties of glass, 685, 3103*

Preston, G. *See* Grace, M. A., 7281

Preston, H. B. *See* Frey, H. B., 5498

Preston, J. S. *See* Barrell, H., 2579

Preston, M. A. Photo-disintegration of O^{16}, 2044. The noncentral electric interaction in alpha-radioactivity, 5711. Radii of even-even nuclei with alpha-fine structure, 8118. Theory of beta-decay, 9666. *See also* Kushneriuk, S. A., 8234

Preston, R. S. *See* Duckworth, H. E., 5675

Preston, W. M. *See* Adamson, R. E., Jr, 2999; Baker, W. D., 3002; Stelson, P. H., 2033, 5753, 8233; Roseborough, W. D., 8965; Willard, H. B., 4703

Preston-Thomas, H. *See* Jackson, L. C., 2702, 5362

Preuss, L. E. *See* Watson, J. H. L., 1089

Price, A. T. Electromagnetic induction in a semi-infinite conductor with a plane boundary, 3648

Price, E. E. *See* Mahan, A. I., 1769

Price, F. P. Calculations of degree of crystallinity in polymers from density measurements, 8238

Price, G. A. *See* Kerst, D. W., 617

Price, H. C., Jr. *See* Langer, L. M., 590

Price, W. C. Recent advances in ultra-violet absorption spectroscopy, 7668. *See also* Hammond, V. J., 7756; Tetlow, K. S., 6103

Price, W. C., Fraser, R. D. B., Robinson, T. S. and Longuet-Higgins, H. C. The infra-red absorption spectra of boron-nitrogen compounds, 7749

Price, W. C., Teegan, J. P. and Walsh, A. D. The absorption spectrum of keten in the far ultra-violet, 5289

Price, W. I. J. and J. J. Trott. Multi-channel apparatus for recording temperatures, 2639

Prichard, A. C., Druesne, M. A. A. and McCaa, D. G. Increase in Q-value and reduction of aging of quartz crystal blanks, 1824

Priestley, C. H. B. On the dynamics of the general atmospheric circulation, 1539. Physical interactions between tropical and temperate latitudes, 9206

Prigogine, I. *See also* Janssens, P., 3345; Mazur, P., 7828, 8696

Prigogine, I., de Brouckère, L. and Amand, R. Research on thermodiffusion in the liquid phase, 120; II, 3385

Prigogine, I. and Mazur, P. On two formulations of hydrodynamics, and the problem of liquid helium II, 8695

Primakoff, H. Photo-production of neutral mesons in nuclear electric fields and the mean life of the neutral meson, 4754. *See also* Porter, C. E., 8992

Primakoff, H. and Villars, F. On soft photon emission in radiation processes, 7532

Prince, E. and Wooster, W. A. The elastic constants of zincblende determined from thermal diffuse scattering of X-rays, 3820

Princep, J. M. *See* Romañá, A., 6612

Pringle, R. W. and Isford, G. Scintillation spectroscopy of the gamma-rays from slow neutron capture in manganese, 8940

Pringle, R. W. and Standil, S. The gamma-rays from neutron-activated gold, 2980

Pringsheim, P. *See* Delbecq, C. J., 5272; Casler, R., 2522

Prins, J. A. Physics of clouds and precipitation (disc.) 4942. The amorphous state, 8239

Prins, J. A., Mulder, J. and Schenk, J. Heat transfer in laminary flow between parallel plates, 8682

Prinzi, L. *See* Bassi, P., 8815

Pritchard, H. O. and Skinner, H. A. Some considerations on the strengths of hybrid bonds in excited states of the hydrogen molecule-ion, 5641

Pritchard, R. L. Discussion of papers by Pachner and by Stenzel on radiation from a circular emitter, 9351

Probstein, R. F. Time lag in the self-nucleation of a supersaturated vapor, 5354

Proca, A. Transmutation of the fundamental particles. Change of spin, 4105

Procelli, P. *See* Cleveland, F. F., 2568

Proctor, W. G. and Yu, F. C. On the nuclear magnetic moments of several stable isotopes, 2924

Prodell, A. G. *See also* Koenig, S., 8146

Prodell, A. G. and Kusch, P. On the hyperfine structure of hydrogen and deuterium, 1257

Prod'homme, L. A note on Raman scattering in glasses, 8653

Prokofev, A. M. Excitation of the high-frequency corona by negative ions, 1858*

Prokofeva, I. A. *See* Ioffe, S. B., 2306

Prokofeva, V. V. *See* Mikhalevskiĭ, V. D., 6181

Prosen, E. J. *See* Knowlton, J. W., 7826

Prost, M. Hydration of quinine sulphate and the accompanying luminescence and electrical phenomena, 3463

Proudman, I. A comparison of Heisenberg's spectrum of turbulence with experiment, 1644

Prowse, W. A. and Jasinski, W. Observations on the electrical breakdown of gases at 2 800 Mc/s, 9508

Pryce, A. W. *See* Gebbie, H. A., 3988

Pryce, M. H. L. Spin-spin interaction within paramagnetic salts, 3634. *See also* Abragam, A., 2821, 5576–7

Pryce, M. H. L. and Simon, F. E. Quantum mechanics and low-temperature research, 1599

Pryor, M. G. M. Mechanical properties of fibres and muscles, 6655

Puddington, I. E. Electromagnetic mercury pumps for circulating gases, 8321. *See also* Sirianni, A. F., 4857

Puff, H. *See* Juza, R., 9831

Pugh, E. M. *See also* Rostoker, N., 5622

Pugh, E. M., Rostoker, N. and Schindler, A. On the Hall effect in ferromagnetics, 1955

Pugh, E. M., von Heine-Geldern, R., Foner, S. and Mutschler, E. C. Kerr cell photography of high speed phenomena, 4990

Puig, A. Camuñas. *See* Camuñas Puig, A.

Pujolle, J. and Boisard, J. Measurement of the reverberation times of the studio of La Radiodiffusion Française, 917

Pulford, A. G. and Walsh, A. The infra-red spectrum and thermodynamic constants of nitrosyl chloride, 8631

Pullar, J. D. and Dymond, E. G. Meson production in the atmosphere, 8827

Pullman, A. and Pullman, B. Natural hypsochromic shifts, 7696

Pullman, B. *See* Pullman, A., 7696; Mayot, M., 8875

Pulsford, E. W. *See* Cooke-Yarborough, E. H., 4475

Pulvari, C. F. An electrostatically induced permanent memory, 7838

Pumper, E. Ya. Level of the electric fluctuations in some metals after tempering, 6207. *See also* Ravskiv, S. M., 1784

Pumphrey, R. J. Upper limit of frequency for human hearing, 6660

Pungs, L. *See* Kröner, 286
Puppi, G. On statistical models of nuclei, 540. *See also* Bassi, P., 474
Puranik, P. G. *See* Bhagavantam, S., 210
Purbrick, R. L. The band spectrum of HgIn, 2519
Purbrick, R. L., Cherry, L. T. and Carpenter, J. F. The design of thin-windowed Geiger–Müller counters, 7965
Purcell, E. M. Nuclear resonance in crystals, 7382
Purcell, E. M. and Bainbridge, K. T. The effect of the Hartree potential in nuclear transitions, 8184
Purcell, E. M. and Pound, R. V. A nuclear spin system at negative temperature, 4607
Purcell, J. D. *See* Tousey, R., 9209
Purnam, T. M. *See* Miller, J. F., 1870
Pusset, L. A. Diffraction of homocentric rays, 6900
Putilova, I. N. *See* Gindin, L. G., 2721, 6248
Putley, E. H. *See also* Chasmar, R. P., 7870
Putley, E. H. and Arthur, J. B. Lead sulphide—an intrinsic semi-conductor, 9470
Putnam, C. R. The quantum-mechanical equations of motion and commutation relations, 8497
Putseĭko, E. K. Photoelectric sensitivity and optical absorption of thallium halide salts, 8738

Quaranta, A. A., Mezzetti, L., Pancini, E. and Stoppini, G. On the migration velocity of electrons in mixtures of argon and alcohol, 9545
Quareni, G. *See* Ceccarelli, M., 2944, 3722; Paganelli, M., 9678
Quastler, H. *See* Luce, W. M., 3246
Quate, C. F. *See* Cutler, C. C., 3567
Queney, P. Atmospheric waves associated with discontinuities of a vortex (planetary and cyclonic waves), 7413
Quercia, I. F. *See also* Del Pianto, E., 3468
Quercia, I. F., Rispoli, B. and Sciuti, S. The positive excess and east-west asymmetry of the penetrating component of cosmic rays between sea level and 7 500 m altitude, 1915
Querzoli, R. *See* Ageno, M., 212, 9389; Mezzetti, L., 423, 3607
Quimby, S. L. *See* Pochapsky, T. E., 105
Quinn, F. A., Jr, Roberts, D. E. and Work, R. N. Volume-temperature relationships for the room temperature transition in Teflon, 7807
Quinn, H. F. A spectrophotometric determination of exhaust gas temperatures in the pulse-jet engine, 1013
Quinn, H. F. and Bourque, O. J. A new flash illumination unit for ballistic photography, 4980
Quinn, H. F., McKay, W. B. and Bourque, O. J. A Kerr cell camera and flash illumination unit for ballistic photography, 776
Quinnell, E. H. *See* Clement, J. R., 1021
Quintin, M. Variations of oxidation-reduction potential during the precipitation of ferrous and ferric hydroxides, 5866. *See also* Fournier, M., 4881
Quirk, R. F. *See* Fortmiller, L., 1554
Qurashi, M. M. *See* Edmunds, I. G., 9146
Qvarnström, B. An analogue computer for systems of linear differential equations, with special reference to problems of aircraft stability, 3259

Raab, L. A direct indicating anemometer, 758
Raal, F. A. *See* Carman, P. C., 3162, 9325, 9790
Rabideau, S. W. Magnetic susceptibilities of praseodymium oxides, 7099
Rabin, B. M. and Strashkevich, A. M. The trajectories of charged particles slightly deviated from their initial direction by an electrostatic field, 7006
Rabin, B. M., Strashkevich, A. M. and Khin, L. S. Electron-optical properties of electrostatic systems with apertures deviating from an ideal shape, 9518
Rabinovitch, B. S. *See* Reilly, C. A., 4758
Rabinowicz, E. An investigation of surface damage using radioactive metals, 3845
Rabinowicz, E. and Tabor, D. Metallic transfer between sliding metals: an autoradiographic study, 9036
Racah, G. On the spectrum of Th iii, 181
Racah, G. and Zeldes, N. On the spins of Li^6 and B^{10}, 1234
Rachinger, W. A. *See* Wood, W. A., 5839
Radavich, J. and Wert, C. Study of precipitates of C and N in iron with an electron microscope, 4791
Radhakrishnan, A. and Ramachandran, G. N. Unit cell and space-group of sodium tartrate $Na_2C_4H_4O_6$, $2H_2O$, 5927
Radhakrishnan, T. Temperature variation of the refractive index of lithium fluoride, 933. The refraction of magnesium oxide and its temperature variation, 934
Radicati, L. A. *See* Cini, M., 1623, 2383, 7556, 8990
Rado, G. T. On the inertia of oscillating ferromagnetic domain walls, 8020
Rado, G. T. and Terris, A. Magnetization processes in a ferrite, 7108
Rado, G. T., Wright, R. W. and Emerson, W. H. Ferromagnetism at very high frequencies. III. Two mechanisms of dispersion in a ferrite, 1178
Radok, J. R. M. Solution of a heat flow problem, 5348
Radvanyi, P. *See* Dreyfus, B., 4684, 6261
Radzievskiĭ, V. V. Planetocentric effect of radial retardation, 2313. The restricted problem of three bodies with allowance for radiation pressure, 5979
Raeth, C. H., Sevold, B. J. and Pederson, C. N. A multiple-anode anticoincidence ring counter, 7967
Raether, H. The application of electron diffraction to the study of alloy single crystals, 1518. Electron diffraction study of the order-disorder transformation of the $AuCu_3$ alloy, 2086
Raff, S. J. Reflecting surface to simulate an infinite conducting plane, 5608
Raffelsieper, J. *See* Kuhlmann, D., 3826
Raffle, J. F. *See* Ashmore, A., 9695
Raievski, V. and Yvon, J. Modulation of neutron flux in the reflector of a pile under the effect of absorption and diffusion, 623
Raimond, J. J., Jr The temperature of the moon, 3273
Rainbird, R. W. *See* de Waele, A., 3508
Rainwater, J. *See* Friedman, H. L., 4750; Tittman, J., 3777
Rainwater, L. J. *See* Havens, W. W., Jr, 9735
Rais-Ahmed. Comment on notes (on the Joshi effect) by C. V. Bakore and H. J. Arnikar, 5439
Rais-Ahmed and Gill, P. S. A note on Joshi effect, 341
Raĭskiĭ, S. M. and Pumper, E. Ya. A method of producing short impulses of light, 1784
Rajan, V. D. *See* Banerjee, S. S., 8855–6
Rajeswari, V. *See* Mehta, G. K., 5257
Rakitin, D. F. *See* Podgoretskiĭ, M. I., 429
Rall, W. *See* Allen, R. C., 3014; McNeill, K. G., 9701
Ramachandra Rao, B. A new method for measuring velocities of ultrasonic waves in liquids, 914
Ramachandran, G. N. Photo-elasticity of diamond, 996. *See also* Radhakrishnan, A., 5927
Ramachandran, G. N. and Chandrasekharan, V. Photoelastic constants of sodium chlorate, 6153
Ramachandran, G. N. and Wooster, W. A. Determination of elastic constants of crystals from diffuse reflexions of X-rays. I. Theory of method, 9131; II. Application to some cubic crystals, 9132
Ramadier-Delbès, J. Interference with thin films in the infra-red determination of the refractive index of fluorite from 7 to 15 μ, 2576. Determination of the ordinary refractive index of calcite in the region 5–14 μ, 5236. Anomalous dispersion of carbon disulphide on both sides of the fundamental infra-red frequency at 1523 cm^{-1}, 6830
Ramaiah, N. A. Field intensity as a determinant of negative Joshi effect, 4404
Ramakrishna Rao, V. Some new relations in the interval factors and the general case of the l^r electron configuration, 552
Ramakrishnan, A. Stochastic processes relating to particles distributed in a continuous infinity of states, 15. *See also* Bhabha, H. J., 1154
Raman, C. V. Structural birefringence in amorphous solids, 995
Raman, C. V. and Jayaraman, A. The structure of labradorite and the origin of its iridescence, 733. The luminescence of diamond and its relation to crystal structure, 969
Raman, C. V., Jayaraman, A. and Srinivasan, T. K. The structure and optical behaviour of the Ceylon moonstones, 1474
Ramanamurti, M. V. and Shamin Ahmad, S. Suppression of high frequencies in the production of Joshi effect, 2718

Ramanathan, K. R. and Karandikar, R. W. Recent work on the measurement of atmospheric ozone and its vertical distribution in India, 6621

Ramasastry, C. and Sreeramamurty, K. Band spectrum of zinc bromide, 945

Ramaseshan, S. The magneto-optic constants of sodium bromide, 8862

Ramaseshan S. and Chandrasekharan, V. Faraday effect and birefringence, 8864

Ramavataram, K. *See* Bhagavantam, S., 903

Ramberg, E. *See* Sommerfeld, A., 1175

Ramler, W. J. and Freedman, M. S. The scintillation efficiency of anthracene for low energy electrons, 1127; Erratum, 2766

Ramm, C. A. *See* Collins, E. R., 6453

Ramsay, J. V. A phase contrast method for the study of the state of polish of single glass surfaces, 2595*. *See also* Makinson, R. E. B., 7912

Ramsdell, L. S. and Kohn, J. A. Disagreement between crystal symmetry and X-ray diffraction data as shown by a new type of silicon carbide, 10*H*, 3926

Ramsey, D. A. *See* Crawford, B. L., Jr, 4281

Ramsey, J. A. Structure of a deformed metallic grain, 2100

Ramsey, J. A., Falloon, S. W. H. W. and Machin, K. E. An integrating flame photometer for small quantities, 3423*

Ramsey, N. F. The nuclear magnetic moment of scandium^{45}, 1243. Magnetic shielding of nuclei in molecules, 7149. Dependence of magnetic shielding of nuclei upon molecular orientation, 8100. Radio-frequency spectra of H_2 and D_2 by a new molecular beam resonance method, 8105. Measurement of nuclear polarizabilities by nuclear scattering experiments, 8129. *See also* Birge, R. W., 7026; Bodansky, D., 7258; Cross, W. G., 2989; Davenport, L. L., 8781; Kolsky, H. G., 203, 1740, 5672

Ramsey, N. F. and Pound, R. V. Nuclear audiofrequency spectroscopy by resonant heating of the nuclear spin system, 4606

Ramsey, W. H. On the instability of small planetary cores. I, 3274. The planets and the white dwarfs, 5046

Ranade, J. D. Hyperfine structure in the spectrum of bromine. II, 3431. The electric quadrupole moment and the magnetic moment of the bromine nucleus, 3704

Ranby, P. W. Silver as an activator of halophosphate phosphors, 7761

Ranc, G. *See* Colombani, A., 5901, 8339

Rand, R. C. Prandtl–Meyer flow behind a curved shock wave, 887

Randall, C. A. and Hazen, W. E. The ratio of electrons to mesons 1 100 feet underground, 3604

Randall, C. A., Sherman, N. and Hazen, W. E. The absorption of penetrating cosmic rays underground, 454

Randall, J. T. Optical methods in cytology, 8672. *See also* Butler, J. A. V., 6655

Randall, R. F. Y. *See* Andrade, E. N. Da C., 2112

Randall, W. F. Recent developments in alloys for instrument manufactures, 3827

Randle, T. C. *See also* Cassels, J. M., 5743; Taylor, A. E., 3038, 5786, 8207

Randle, T. C., Dickson, J. M. and Cassels, J. M. Cross-section for the reaction ^{9}Be $(p, p2n)^7$Be at 156 MeV, 8960

Rank, D. H. On the polarization of Rayleigh scattering as an aid to determine molecular configuration in liquids, 5335

Rank, D. H., Light, J. H. and Yoder, P. R., Jr. A photoelectric polarimeter, 242

Rank, D. H., Ruth, R. P. and Sluis, K. L. V. The compound Fabry–Perot interferometer, 5319

Rank, D. H., Saksena, B. D. and Shull, E. R. Vibrational spectra of carbon and silicon tetramethyl and their monodeutero derivatives, 7713

Ranke, O. F. Theory of operation of the cochlea: a contribution to the hydrodynamics of the cochlea, 2256

Rankin, B. *See* Bradner, H., 633, 3044

Rankowitz, S. *See* Higinbotham, W. A., 9552

Ransley, C. E. Determination of phase boundaries in solid alloy systems by a diffusion technique, 7304

Rao, A. S. *See also* Chandrasekharan, K. S., 1162; Gokhale, G. S., 1163

Rao, A. S., Balasubrahmanyam, V. K., Gokhale, G. S. and Pereira, A. W. High altitude measurements of the penetrating component intensity of cosmic radiation near the geomagnetic equator, 7991

Rao, B. Ramachandra. *See* Ramachandra Rao, B.

Rao, B. S. *See* Bruckshaw, J. McG., 1526

Rao, D. A. A. S. Narayana. *See* Narayana Rao, D. A. A. S.

Rao, K. Suryanarayana. *See* Suryanarayana Rao, K.

Rao, M. R. A. Electron microscopic studies in aqueous sols, 2141

Rao, M. V. A note on the Raman spectra of CH_2Cl_2 and $CHCl_3$ in the vapour state, 7773

Rao, R. V. G. Sundara. *See* Sundara, Rao R. V. G.

Rao, T., Seshagiri. *See* Seshagiri Rao, T.

Rao, V. Ramakrishna. *See* Ramakrishna Rao, V.

Rappoport, I. D. *See* Dobrotin, N. A., 8813

Rasetti, F. *See* Madansky, L., 7245

Raševskiĭ, P. K. The statistics of Bose–Einstein and Fermi–Dirac from the tensor point of view, 9286

Rasmussen, J. O. *See also* Hoff, R. W., 9657

Rasmussen, J. O., Reynolds, F. L., Thompson, S. G. and Ghiorso, A. Mass assignments of alpha-active isotopes in the rare-earth region, 2008

Rasmussen, S. *See* Harris, S. P., 2073

Ratcliff, F. *See* Riggs, L. A., 8392

Ratcliffe, J. A. *See* Bracewell, R. N., 4559

Rathenau, G. W. and Baas, G. Grain growth in a texture, studied by means of electron-emission microscopy, 5904

Rathgeber, H. D. Remarks on the latitude effect of cosmic rays at sea-level, 1161. On the production of mesons by primary cosmic rays, 4755. *See also* Cara, D. E., 5516; Goodman, P., 2782; Law, P. G., 446

Ratier, J. *See* Benoist-Gueutal, P., 1317

Ratner, S. B. Photographic recording of an explosion wave formed outside a linear charge (h.e.), 7337

Rau, R. R. The nature of wide-angle sprays. I, 2790

Rau, R. R. and Harris, G. G. Wide angle sprays produced by cosmic radiation, 466

Rau, R. R. and Wightman, A. S. The nature of wide-angle sprays. II, 2791

Rau, W. Function of the freezing nuclei in supercooled water, 3386

Rauch, S. E. Mathematical data for electron drain on positive ion sources, 9523

Raudorf, W. An electronic ram, 7933

Raumann, G., Nixon, I. S. and Denbigh, K. G. Transition between laminar and turbulent flow in various liquids, 1643

Rautian, G. N. Investigation of the colour vision of 995 individuals, 2244

Ravenhall, D. G. The effect of screening of [on] the cross section for pair production by electrons, 1297. *See also* Brown, G. E., 8515

Ravenhill, P. and Craggs, J. D. Afterglows in hydrogen discharges, 8748

Rawer, K. On the approximate zoning of the F_2 layer ionization from the world-wide standpoint, 3977. *See also* Eyfrig, R., 1536

Rawles, W. T. Measurement and control of bulk density, 1634

Rawson, H. A method of sealing sapphire to glass, 6911. A theory of stresses in glass butt seals, 7325

Ray, A. K. On the Raman spectra of naphthalene at low temperatures, 5302. *See also* Sirkar, S. C., 978

Ray, B. R. *See* MacInnes, D. A., 8544

Ray, W. *See* Owen, G. E., 7969

Raymond, R. C. The well-informed heat engine, 4358. *See also* McLucas, J. L., 9459; Murphy, J. A., 291; Walker, M. J., 1953

Rayner, G. H. and Ford, L. H. The stability of mica standards of capacitance, 6191

Raynor, G. V. *See* Henry, W. G., 3679; Jawson, M. A., 3677–8; Pratt, J. N., 2267

Rayski, J. Remarks on the non-local electrodynamics, 6733. Non-local quantum electrodynamics, 7522. Remarks on some non-linear effects in field theory. I, 7542. On the reciprocal field theory, 9273

Rayski, J. and Rzewuski, J. On a system of fields free of divergences of the mass-renormalization type, 7526

Rayski, J. and Średniawa, B. Non-linear effects in the theory of quantized fields. II, 7543

Razouk, R. I. and El Gobeily, M. A. The expansion of charcoal upon the adsorption of gases and vapors, 2142

Read, H. J. *See* Weil, R., 777

Read, J. The lateral distribution of ions across the track of an ionizing particle. II, 7043

Read, W. T., Jr. Formulas for the determination of residual stress in wires by the layer removal method, 4792. *See also* Frank, F. C., 673; Treuting, R. G., 3085

Reasbeck, P. *See* Chackett, K. F., 9846

Rebaud, S. *See* Moucharrafieh, H., 8010

Reber, G. Motion in the solar atmosphere as deduced from radio measurements, 5028

Rebinder, P. A. *See* Rozhanskiĭ, V. N., 6511

Recart, L. C=O vibrations (fundamental and harmonics) studied by means of the infra-red absorption of ketones, 9632

Rector, C. W. *See* Longuet-Higgins, H. C., 531

Reder, F. *See* Ledinegg, E., 287

Redfield, A. and Holt, R. B. Electron removal in argon afterglows, 6996

Redfield, T. A. *See* Dale, E. B., 2987

Reding, F. P. *See also* Lohman, J. B., 5269

Reding, F. P. and Hornig, D. F. The vibrational spectra of molecules and complex ions in crystals. V. Ammonia and deutero-ammonia, 6382

Redlich, O. and Kister, A. T. On a distillation theorem by Schreinemakers, 689

Reed, E. F. *See* Bitter, F., 4519

Reed, S., Jr. *See* Wegener, P., 7616

Reed, W. O. *See* Amdursky, M. E., 6222; Pakswer, S., 7896

Reeger, E. *See* Ehrenhaft, F., 171, 6822, 9355

Reekie, J. *See* Hutchison, T. S., 9014

Reel, H. L. Experimental contribution to the study of the diffusion of thermal neutrons, 6478

Rees, A. L. G. *See* Cowley, J. M., 8254, 8365

Reese, R. M. *See also* Dibeler, V. H., 2932

Reese, R. M., Dibeler, V. H. and Mohler, F. L. Temperature variation of mass spectra of hydrocarbons, 5506

Reesor, G. E. The absorption of microwaves in excited hydrogen, 8071

Reeyer, E. *See* Ehrenhaft, F., 170

Regel, A. R. *See* Blum, A. I., 9468

Regener, V. H. Vertical distribution of atmospheric ozone, 3975

Regenstreif, E. On the theory of independent electrostatic lens with thick central electrode, 4430. The optical properties of the electrostatic "einzellinse" with a thick central electrode, 4432. Theory of electrostatic lens with central, elliptical aperture, 7938. Theory of the three-electrode electrostatic lens. I, 8770

Regler, H. Glass as a material for apparatus in science and technology, 4877

Reich, H. J., Schultheiss, P. M., Skalnik, J. G., Flynn, T. and Gibson, J. E. Effect of auxiliary current on transistor operation, 7890

Reichender, K. Theory of errors and the adjustment of chains of diamond-shaped figures in radial triangulation, 6013

Reid, C. Observation of discrete bands in the near ultraviolet absorption spectrum of liquid ethylene, 956. The infra-red absorption spectrum of isothiocyanic acid (HNCS), 2537. The multiplicity forbidden absorption bands in the spectrum of pyridine, 2542. Rotation-vibration spectra of diatomic and simple polyatomic molecules with long absorbing paths. V. The spectrum of isocyanic acid, 2547. *See* Herzberg, G., 7748; Moodie, M. M., 7687

Reid, T. J. *See* Cottrell, T. L., 1394

Reifenschweiler, O. On an improved ion source, 8791

Reiffel, L. *See also* Rest, F. G., 5515

Reiffel, L., Stone, C. A. and Rest, F. G. Scintillation spectrum from cosmic rays at 30 000 feet, 6299

Reilley, C. N., Cooke, W. D. and Furman, N. H. Constant-current supply for colorimetric analysis, 9112

Reilly, C. A. and Rabinovitch, B. S. Use of a low temperature bolometer for detecting a beam of free radicals, 4758

Reimbert, M. *See* Langevin, A., 2878

Reimer, C. B. *See* Vallee, B. L., 1717

Reinders, M. E. and Kistemaker, J. A system for handling gases without stopcock grease, 9103

Reinders, M. E., Schutten, J. and Kistemaker, J. Leak detection with a mass spectrometer using hydrogen gas, 9331

Reinebeck, L. *See* Schüler, H., 948, 3444, 3546, 6110, 7686

Reinecke, L. H. *See* Cario, G., 527

Reiner, D. *See* Kip, A. F., 9599

Reiner, M. The rheological aspect of hydrodynamics, 3831

Reiner, M. and Scott Blair, G. W. Original authorship for formulas given in Clark and Deutsch's paper, 111

Reines, F. Second shock in liquid helium II? 4342

Reis, A. J., Slade, J. J., Jr and Weissman, S. A new X-ray diffraction method for studying imperfections of crystal structure in polycrystalline specimens, 5913

Reisner, J. H. Permanent magnet lenses, 5459

Reisner, J. H. and Dornfeld, E. G. A small electron microscope, 370

Reiss, H. The growth of uniform colloidal dispersions, 4856

Reiss, H. and Friedman, L. Critical limits of metastability in binary systems, 5848

Reiss, H. and Saltsburg, H. Asymmetry of inner electron distributions in homonuclear diatomic molecules, 2890

Reissner, E. On a variational theorem in elasticity, 1359. *See also* Clark, R. A., 1365

Reitan, D. K. and Higgins, T. J. Calculation of the electrical capacitance of a cube, 2660

Reitz, J. R. *See also* Metropolis, N., 5652

Reitz, J. R. and Gammel, J. L. Dissociation energies of the Cd^{++} vacancy complex and the double vacancy in sodium chloride, 7380

Reiz, A. A variational solution of a perturbation problem in the theory of stellar structure, 818

Remeika, J. P. *See* Galt, J. K., 4520; Matthias, B. T., 5394

Remick, A. E. *See* Silverman, J., 1432

Remley, M. E. *See* Jentschke, W. K., 6894; Taylor, C. J., 6893

Renard, G. A. Some disintegration schemes by the coincidence method, 579. *See also* Duquesne, M., 1281

Renardier, M. and Avignon, Y. On the use of [track] gaps in nuclear emulsions sensitive to electrons, 9527

Renardier, M., Moucharafieh, H. and Morand, M. The identification of [nuclear] tracks finishing within emulsions sensitive to electrons, 2285

Renaud, P. Experimental study of an electron gun for electron diffraction, 2745. On certain physical and chemical properties of ultrasonic cavitation, 9303

Renouard, P. Deviation of the gases in a flame. Radius of curvature of the blue cone at its apex, 8693

Rescigno, L. *See* Carrelli, A., 8293

Resnick, I. and Hanna, S. S. Angular yield of protons, tritons, and alphas from the deuteron bombardment of beryllium, 5757

Resnick, R. Note on total yield of alphas from $Li^6(d, \alpha)\alpha$, 5756

Rest, F. G. *See also* Reiffel, L., 6299

Rest, F. G., Reiffel, L. and Stone, C. A. Note on soft gamma-component of cosmic rays, 5515

Retherford, R. C. *See* Lamb, W. E., Jr, 554, 3708

Reutersward, C. Fringing field effects on first-order focusing in magnetic spectrographs, 5479

Revell, R. S. M. *See* Agar, A. W., 3082

Reverdin, D. L. Electron optical exploration of space charge in a cut-off magnetron, 3568

Reyden, D. van der. *See* van der Reyden, D.

Reynolds, C. A. *See* Serin, B., 2700

Reynolds, F. L. *See also* Rasmussen, J. O., 2008; Thompson, S. G., 3721

Reynolds, F. L., Hulet, E. K. and Street, K., Jr. Mass-spectrographic identification of Cm^{243} and Cm^{244}, 2933

Reynolds, G. T. *See* Harrison, F. B., 221, 8227

Reynolds, J. H. A new long-lived krypton activity, 569. A mass spectrometric investigation of branching in Cu^{64}, Br^{80}, Br^{82} and I^{128}, 582

Reynolds, L. W. *See* Talbot, S. A., 4200

Reynolds, P. W. *See* Dowden, D. A., 1422

Reynolds, S. A. *See* Leddicotte, G. W., 7367

Reynolds, S. E., Hume, W., II, Vonnegut, B. and Schaefer, V. J. Effect of sunlight on the action of silver iodide particles as sublimation nuclei, 5940

Rhodes, D. R. Theory of axially slitted circular and elliptic cylinder antennas, 522

Rhodes, P. Fermi–Dirac functions of integral order, 1627

Rhodes, R. G. A low-temperature microscope stage, 1786. Barium titanate twinning at low temperatures, 3903

Rhodin, T. N., Jr. Single crystal copper surfaces, 746. Low temperature oxidation of copper. I. Physical mechanism, 3073; II. Reaction rate anisotropy, 9045. The anisotropy of nitrogen adsorption on single crystal copper surfaces, 3166

Rhys, A. *See* K. Huang, 3196

Riabouchinsky, D. Approximately uniform, permanent subsonic, sonic and supersonic flow, 2443. On a paradox noted by Mr. Garret Birkhoff, 3395. Several considerations of transonic slip, 5170

Ribe, F. L. Electron-capture cross sections for protons passing through hydrogen gas, 9564. *See also* Groetzinger, G., 1285, 4451, 4749

Ribeiro, J. Costa. *See* Costa Ribeiro, J.

Ricamo, R. (n, n) and (n, p) resonances in P^{31} and S^{32}, 8980. *See also* Baldinger, E., 1323; Lüscher, E., 621

Ricamo, R., Zünti, W., Baldinger, E. and Huber, P. Scattering of fast neutrons by carbon and oxygen, 1324

Ricard, R. and Dufour, A. Observations on the spectra of arcs in air and hydrogen between aluminium electrodes, 9366

Rice, B., Gonzalez Barredo, J. M. and Young, T. F. The Raman spectrum of tetramethyldiborane. Apparatus for the production of Raman spectra at low temperatures, 7771

Rice, O. K. The thermodynamics of liquid helium of He^3–He^4 solutions, 1019. Introduction to the symposium on critical phenomena. General consideration of critical phenomena, 1798

Rich, J. A. Experimental evidence for the three-photon annihilation of an electron-positron pair, 3748

Richards, D. L. An outline of the principles of design and analysis of experiments, 8433

Richards, E. W. T. and Cole, J. F. I. Scintillations from thin films, 3462

Richards, H. T. A note on the beta-decay of F^{17}, 8931

Richards, H. T., Johnson, V. R., Ajzenberg, F. and Laubenstein, M. J. W. Proton range-energy relation for Eastman NTA emulsions, 8790

Richards, H. T., Smith, R. V. and Browne, C. P. Proton-neutron reactions and thresholds, 2035

Richards, R. B. *See* Cross, L. H., 7707

Richards, T. L. *See* Cook, M., 3829

Richardson, A. S., Jr. The remainder theorem and its application to operational calculus techniques, 1559

Richardson, E. G. The formation and flow of emulsion, 1441. *See also* Matta, K., 4193

Richardson, H. O. W. *See* Braid, T. H., 2738

Richardson, J. E. The high energy neutrons from the disintegration of C^{13} by deuterons, 3011. *See also* Phillips, G. C., 1347

Richardson, J. M. and Holt, R. B. Decay of the hydrogen discharge, 3541

Richardson, J. R. *See* Ruby, L., 2972, 8169; Sachs, D. C., 7956

Richardson, L. F. Spectrum of atmospheric turbulence, 4948

Richardson, R. E., Ball, W. P., Leith, C. E. and Moyer, B. J. Elastic scattering of 340-MeV protons, 8963

Richardson, R. E. and Sewell, D. C. A device for determining the direction of flux lines in the time varying magnetic field of a particle accelerator, 9585

Richardson, R. S. *See* Greenstein, J. L., 6689

Richardson, W. S. and Goldstein, J. H. The infra-red spectrum of chloroacetylene and deuterochloroacetylene, 960

Richert, E. D. *See* Dale, E. B., 2987

Richman, C. *See also* Watson, K. M., 9691; Whitehead, M. N., 8962

Richman, C., Skinner, M., Merritt, J. and Youtz, B. Production of a π^+ meson beam using the deflected proton beam of the 184-inch synchro-cyclotron, 3043

Richmond, R. *See* Kelly, F. M., 1978

Richter, A. F. The di-iso-electronic row and the effective charge in the L isorows, 1250

Richter, H. and Fürst, O. Amorphous germanium, 5820

Richter, M. Experiments towards establishing a colour system based on equal sensory differences, 5338

Riddiford, L. Conference on vacuum physics—Birmingham, 1950 (conf. rep.), 881. The importance of gas scattering in particle accelerators, 2760. An air-cored synchro-cyclotron for 400 MeV protons, 4446

Rideal, E. K. Lord Kelvin's contributions to surface chemistry. [The 41st Kelvin lecture], 708. Adsorption and catalysis on metals. Introductory paper I, 2125. *See* Gilbert, G. A., 9110; McIntosh, R., 8312

Rideal, E. K. and Roberts, R. The photochemistry of native proteins, 3866

Rideal, E. K. and Trapnell, B. M. W. The mechanism and temperature coefficient of the parahydrogen conversion, 1411. Adsorption on evaporated tungsten films. I. Oxygen and carbon monoxide chemisorption and the determination of film surface areas, 3876

Rideau, G. The transformation into momentum space in the theory of collisions, 1597. The Fourier transformation of Dirac's equation, 2380. Method for the study of perturbations of limited duration, 6039. On the conservation of energy in quantum mechanics, 6040. On the fourth uncertainty relation, 7557

Ridgway, S. L. *See* Muether, H. R., 2978

Ridout, M. S. *See* Billig, E., 7892

Riedel, O. A diagram for the evaluation of unknown nuclear magnetic moments, 4606

Rieder, W. The Szilard–Chalmers effect with slow and fast neutrons, 3756, 9779

Rieder, W., Müller, H. and Broda, E. On the Szilard–Chalmers effect with fast neutrons, 9070

Riess, K. and Baudean, J. E. Some experiments in viscous fluid flow, 4143

Riehl, N. and Wirths, G. On the dependence of the diffusivity of dissolved substances on mass and volume of the particles, 9318

Ries, H. E., Jr. *See* van Nordstrand, R. A., 9787

Riet, R. van. *See* van Riet, R.

Riety, P. A regulator for sound field strength, 4195

Rifkin, E. B. *See* Kerr, E. C., 3485

Rigby, E. C. *See* Woonton, G. A., 4550

Riggs, L. A. and Ratliff, F. Visual acuity and the normal tremor of the eyes, 8392

Righini, G. The photoelectric determination of high temperatures, 5367

Righini, G. and Godoli, G. The physical meaning of the character figures of solar phenomena, 2331. On the characteristic numbers of solar activity, 3282. Statistical research on the floccular cycle. I. Correlation between the activity of sunspots and flocculi, 4052; II. Migration in latitude of flocculi, 4053

Righini Crino, B. The influence of the slit width of the spectrograph on the distribution of energy in the continuous spectrum. I, 6837; II, 8617

Rigollet, R. On a study of the radiant of the Boötids by the telescopic method and on an attempt to determine the velocity of these meteors by the observation of the hourly drift of the radiant, 6684

Rigrod, W. W. Behaviour of the resistance ignitor in mercury, 6244

Rikitake, T. The electrical state of the earth's interior as inferred from variations in the earth's magnetic field, 6610

Riley, D. P. The application of high-intensity X-ray beams in biological and colloid chemistry, 2722. The modified 50-kW X-ray generator at the Davy Faraday Laboratory, 2722

Riley, N. A. *See* Smith, A. H., 4330

Rinehart, J. S A demonstration of specific acoustic resistance, 3411. Some quantitative data bearing on the scabbing of metals under explosive attack, 5812. A remark on the composition dependence of the elastic parameters of beta-brass, 8260. Work-hardening of mild steel by explosive attack, 9031. Some experimental indications of the stresses produced in a body by an exploding charge, 9755

Rinfret, M. *See* Bertrand, M., 2609; Rivest, R., 2589
Ringo, G. R. *See* Hibdon, C. T., 6483; Krueger, H. H. A., 2070
Riopelle, A. J. *See* Mote, F. A., 2252, 4962
Ripa, O. and Speakman, J. B. Plasticity of wool, 679
Ripelle, M. Fabre de la. *See* Fabre de la Ripelle, M.
Riquelme, O. García. *See* García Riquelme, O.
Riseman, J. *See also* Schoenberg, M. D., 1439
Riseman, J. and Ullman, R. The concentration dependence of the viscosity of solutions of macromolecules, 5163
Rispoli, B. *See* Quercia, I. F., 1915
Ritchie, A. B. and Spragg, W. T. A set of parts for the remote handling of radioactive substances, 7434
Ritchie, A. W. *See* Beeck, O., 1407
Ritland, H. N., Kaesberg, P. and Beeman, W. W. An X-ray investigation of the shapes and hydrations of several protein molecules in solution, 1227
Ritschl, R. Non-adiabatic transitions in hydrogen in rapidly alternating electric fields, 8147
Ritson, D. M. Slow mesons in the backward flux of the cosmic radiation, 480. Absorption of penetrating shower, 3614. *See also* Messel, H., 1907, 2286
Ritter, H. L., Harris, R. L. and Wood, R. E. On the X-ray absorption correction for encased diffractors in the Debye–Scherrer technique, 3203
Ritter, O., Lieseberg, C., Maier-Leibnitz, H., Papkow, A., Schmeiser, K. and Bothe, W. Cloud chamber study of the scattering of positrons by electrons, 7939
Rittner, E. S. Binding energy and dipole moment of alkali halide molecules, 8108
Ríus, A. and Marín, A. Determination of the capacity of the double electrical layers of a mercury jet electrode. III. Determination of the maximum electrocapillaries and capacitance of the double electrical layer in solutions containing no oxygen, 1427
Riutort, A. Gimeno. *See* Gimeno Riutort, A.
Rivest, R. and Rinfret, M. Effect of small refractive index differences between the solution and the solvent on light-scattering molecular weight, 2589
Rivier, D. C. On a one-one correspondence between infinitesimal canonical transformations and infinitesimal unitary transformations, 8495
Rivlin, R. S. Mechanics of large elastic deformations with special reference to rubber, 6509
Rivlin, R. S. and Saunders, D. W. Large elastic deformations of isotropic materials. VII. Experiments on the deformation of rubber, 5825
Rivlin, R. S. and Thomas, A. G. Large elastic deformations of isotropic materials. VIII. Strain distribution around a hole in a sheet, 5826
Rivoir, L. and Abbad, M. Method for the determination of the position of the heavy atoms in the study of crystal structure, 3919
Roaf, D. *See* Frisby, J. H., 3718
Roald, B. and Streicher, M. A. Corrosion rate and etch structures of aluminium; effect of heat treatment and impurities, 703
Robb, W. L. and Drickamer, H. G. Transport properties of dense media. I. Thermal diffusion in isotopic mixtures of gases, 879. Transport phenomena in dense media. II. Thermal diffusion in compressed gases, 7605
Robbins, E. J. *See* Collinge, B., 2573
Roberson, R. E. Random noise in an attenuating fluid medium, 5185
Roberts, A. *See* Clark, D. L., 8224; Moon, M. L., 596; Waggoner, M. A., 2018
Roberts, B. W., Jr, Perry, K. E. and Fluharty, R. G. An improved resolving time measuring device, 1133
Roberts, C. S. *See* Lement, B. S., 4331
Roberts, D. E. *See also* Quinn, F. A., Jr, 7807
Roberts, D. E. and Jessup, R. S. Heat of polymerization of alpha-methylstyrene from heats of combustion of monomer and four polymer fractions, 3882
Roberts, F. *See* Young, J. Z., 3473
Roberts, F. F. A note on the ferromagnetic Faraday effect at centimetre wavelengths, 6329
Roberts, G. N. *See* Dodd, C., 292
Roberts, J. H. *See* Guier, W. H., 603
Roberts, J. S. *See* Murawski, J., 6527
Roberts, K. V. On the quantum theory of the elementary particles. I. Introduction and classica field dynamics, 1604; II. Quantum field dynamics, 6730. Remarks on relativistic quantum mechanics, 3320. An equivalence theorem in meson theory, 7294
Roberts, L D., Hill, J. E. and McCammon, G. A study of the slowing down distribution of Sb^{124}-Be photo-neutrons in graphite, and of the use o indium foils, 1326
Roberts, M. H. *See* Hartshorne, N. H., 5905
Roberts, R. *See* Rideal, E. K., 3866
Roberts, S. Revised dielectric parameters of alkali and halide ions, 3899. Polarizabilities of ions in Perovskite-type crystals, 4901. Piezoelectric effec in lead zirconate, 9453
Roberts, S. and Williams, F. E. Theory of the luminescence of sulfide phosphors, 211
Roberts, T. R. The H_2–D mass difference and the determination of secondary atomic mass standards, 4620. *See also* Nier, A. O., 4621
Roberts, V. *See* Gebbie, H. A., 3988
Robertson, H. P. The geometrics of the thermal and gravitational fields, 3318
Robertson, J. The measurement of bond lengths in conjugated molecules of carbon centres, 7163
Robertson, J. H. A simple machine capable of Fourier synthesis calculation, 9. Interpretation of the Patterson synthesis: rubidium benzyl penicillin, 2174
Robertson, J. H. and Beevers, C. A. The crysta structure of strychnine hydrogen bromide, 6597
Robertson, J. M. The crystal structure of cupric tropolone and the dimensions of the tropolone ring, 8360. *See also* Binnie, W. P., 1515; Coulson, C. A., 7162
Robertson, R. F. S. and Selwood, D. W. An automatic magnetic balance for the study of ferromagnetic materials, 4538
Robertson, W. D. Correlation of ionic and atomic radii with the heat of hydration, 1254
Robertson, W. W. and Matsen, F. A. Molecular orbital theory and spectra of monosubstituted benzenes. II. Thiophenol, 2884; III. Compounds of the type $(C_6H_5)_2X$, 2885; IV. The phenyl halides and the inductive effect, 2886; VI. Styrene, Phenylacetylene and phenylcycloalkanes, 2888
Robillard, T. R. *See* Hibdon, C. T., 6483
Robin, J. *See* Robin, S., 6105
Robin, S. *See also* Schwetzoff, V., 9481–2
Robin, S., Robin, J. and Vodar, B. Experimental study of the perturbation of the sodium *D* lines by nitrogen and argon at pressures up to 1 000 kg/cm², 6105
Robin, S. and Romand, J. Study of the perturbation of the 1 469 Å line of xenon by argon under pressure up to 650 kg/cm², 3433
Robin, S., Romand, J. and Oksengorn, B. Use of compressed gases as solvents in the Schumann region, 1745
Robin, S. and Vodar, B. Dissolution of phenanthrene in compressed gases, 1656. Vacuum double monochromator for the ultra-violet, 8626. Valve for pure gases compressed to pressures of the order of 1000 atmospheres, 9104
Robin, S., Vodar, B. and Bergeon, R. An attempt to interpret the solution of a solid in a compressed gas, 7623
Robins, A. B. *See* Barrer, R. M., 9089
Robinson, A. Wave reflexion near a wall, 7618
Robinson, A. A. *See* Williams, F. C., 7450
Robinson, C. Interferometric studies in diffusion. I. Determination of concentration distributions, 1651. *See also* Crank, J., 1652
Robinson, C. and Bott, M. J. Optical rotation and chain folding in synthetic polypeptides and gelatin, 9796
Robinson, C. V. A methane, proportional counting method for the assay of tritium, 7201
Robinson, D. W. Anechoic chamber for acoustic measurements, 6089
Robinson, D. Z. The experimental determination of the intensities of infrared absorption bands. IV. Measurements of the stretching vibrations of OCS and CS_2, 7694

Robinson, D. Z. and Cole, R. Note on optimum transmittance in spectrophotometry, 8620

Robinson, E. S. *See* Dieke, G. H., 947

Robinson, G. D. Two notes on temperature changes in the troposphere due to radiation, 4932. *See also* Goody, R. M., 9847

Robinson, H. P. *See* Barton, G. W., Jr, 3750

Robinson, J. E. Adiabatic oscillations in liquid helium, 6175. Note on the Bose-Einstein integral functions, 7568

Robinson, J. V. The viscosity of suspensions of spheres. II. The effect of sphere diameter, 6769

Robinson, K. Elastic energy of an ellipsoidal inclusion in an infinite solid, 8256. *See also* Brindley, G. W., 1485

Robinson, T. S. *See* Price, W. C., 7749

Robley, R. *See* Daudin, A., 5531

Robson, J. M. The radioactive decay of the neutron, 7205

Rocard, Y. On a mechanism of coronal radio emission, 4048. Guided sound waves, 4181. On the application of Nernst's principle to liquids, 5377. On the possibility of purely mechanical transformers, 6797. On the subject of the absorption of sound in mists, 7639

Rochat, O. *See* Fowler, P. H., 9722; Gottstein, T., 7954; Menon, M. G. K., 7941; O'Ceallaigh, C., 9231

Rochester, G. D. and Rosser, W. G. V. The nuclear interactions of cosmic rays, 7058

Rock, S. M. Qualitative analysis from mass spectra, 4880

Roderick, H. *See* Hofstadter, R., 6481

Roderick, J. F. Sensitometry in roentgenology, 4019

Rodichev, V. *See* Ivanenko, D., 3694

Rodier, G. *See* Amiel, J., 5898

Rodionov, K. P. *See* Vonsovskiĭ, S. V., 3673

Rodionov, S. F. Concerning the radiation and absorption of light in various layers of the atmosphere, 3991. Transparency of the atmosphere in the ultraviolet part of the spectrum, 9210

Rodionov, S. F. and Frishman, I. G. Infra-red luminosity of the celestial arch in the region of the Milky Way, 8472

Rodionov, S. F. and Osherovich, A. L. A secondary-electron photon recorder, 6282

Roe, A. and Hellmann, M. Determination of an isotope effect in the decarboxylation of malonic–1–C^{14} acid, 5853

Roe, E. M. F. *See* Beale, R. N., 5245

Roerich-Goussu, M. *See* Laporte, M., 4322

Roesler, F. C. Comment on "Gas bubbles in solutions," 4159. Reflections on the Ehrenhaft magneto-photophoresis, 8050

Roess, L. C. *See* Oetjen, R. A. 5232

Rogers, D. The probability distribution of X-ray intensities. IV. New methods of determining crystal classes and space groups, 1494. New methods of direct structure determination using modified Patterson maps, 9827

Rogers, E. H. *See* Levinthal, E. C., 7098

Rogers, F. T., Jr and Morrison, H. L. Convection currents in porous media. III. Extended theory of the critical gradient, 254

Rogers, F. T., Jr and Schilberg, L. E. Observation of initial flow in a fluid obeying Darcy's law by radioactive-tracer techniques, 3367

Rogers, G. L. The black and white hologram, 1770. *See also* Bragg, W. L., 3474

Rogers, J. D., Cox, H. L. and Braunschweiger, P. G. A frequency meter for microwave spectroscopy, 4237

Rogers, J. D., Pietenpol, W. J. and Williams, D. The microwave absorption spectrum of nitrosyl chloride NOCl, 6870

Rogers, L. B. *See* Goddu, R. F., 9650

Rogers, T. F. and Johnson, S. J. Some magneto-acoustic effects in nickel, 911

Rogozinski, A. Possible existence of primary cosmic ray showers, 3612. On a directional effect of Geiger–Müller counters, 9543. *See also* Brière, M., 9549; Picard, E., 4511

Rohmer, R., Freymann, R., Chevot, A. and Hamon, P. Existence of electronic bands of salts of tri- and quadri-valent uranium in the infra-red spectrum; relation to the spectra of plutonium, 953

Rohrlich, F. Quantum electrodynamics of charged particles without spin, 1602. *See also* Newcombe, W. A., 4099

Rohsenow, W. M. and Clark, J. A. A study of the mechanism of boiling heat transfer, 7805

Roĭ, N. A. The nature of electromechanical oscillations in ceramic $BaTiO_3$, 2677

Roizen, S. *See* Brochard, J., 8247

Rojkovsky, D. A. Photographic isophotes of the counterglow, 27

Rojo, A. Due. *See* Due Rojo, A.

Roka, E. G. v. *See* v. Roka, E. G.

Rolfe, A. C. *See* Cross, L. H., 8632

Rolland, M.-T. *See also* Freymann, M., 7702

Rolland, M. T. and Bernard, R. Absorption by adsorbed water within the range of kilometric waves, 5614

Rollefson, G. K. *See* Comstock, A. A., 4820

Rollet, D. and Collet, L.-H. Variations of concentration at electrodes during electrolysis, 6536

Rollin, B. V. *See* Darby, J., 268, 324; Hatton, J., 7906, 8130

Rollmann, H. W. and McMurry, H. L. Parent peak intensities as a basis for estimating purities of deuterium substituted compounds, 7368

Roman, N. G. A correlation between the spectroscopic and dynamical characteristics of the late F- and early G-type stars, 2351

Romañá, A. and Oriol Cardós, J. A contribution to the study of the influence of the moon on telluric currents, 6609

Romañá, A. and Princep, J. M. Contribution to the study of geomagnetic effects of different manifestations of solar activity, 6612

Romand, J. *See also* Bauple, R., 2525; Robin, S., 1745, 3433; Safary, E., 5288

Romand, J. and Safary, E. Conclusion of the study of the ultraviolet absorption spectrum of HF gas, 1731

Romand, J., Schwetzoff, V. and Vodar, B. Some considerations on the detection of gases and the measurement of their pressure by optical absorption in the far ultra-violet, 9802

Romand, J. and Vodar, B. Metal cryostat for the study of solid deposits obtained by freezing with jet of gas, 8702

Romanov, Yu. A. On magnetic moments of nuclei, 7180

Romberg, W. Approximation of an arc of a curve by some sine functions, 3266

Romell, D. Radio reflexions from a column of ionized gas, 3664

Romers, C., Ketelaar, J. A. A. and MacGillavry, C. H. The crystal structure of ammoniumtetrametaphosphate, $(NH_4)_4P_4O_{12}$, 3930

Rona, E. Exchange reactions of uranium ions in solution, 1389

Ronchi, L. A variational principle for the reflection coefficients of the e.m. field, 7117

Ronchi, L. and Toraldo di Francia, G. On the halos due to diffraction in the eye, 9869

Ronchi, V. On the nature of retinal excitement by X-rays, 9866

Rood, J. L. Evaporated zinc sulfide films, 5818

Rooksby, H. P. *See also* Tombs, N. C., 9596

Rooksby, H. P. and Steward, E. G. The barium oxide on tungsten cathode interface, 4490

Rooksby, H. P. and Tombs, N. C. Changes of crystal structure in antiferromagnetic compounds, 4529

Roosebroek, W. van. *See* van Roosebroek, W.

Roquet, J. Thermo-remanence of small disperse magnetite particles, 5559

Rorden, H. C. and Grieco, A. Measurement of dynamic internal dissipation and elasticity of soft plastics, 6508

Rorschach, H. E. and Herlin, M. A. Low temperature resistance minimum in magnesium measured by a mutual inductance method, 4376

Rosano, H.-L. Hysteresis of wetting and stability of drops or air bubbles on a solid surface, 3381

Rosberry, F. W. *See* Hotchkiss, R. N., 8612

Rose, A. Dark adaptation, 6659

Rose, D. C. The meson spectrum and meteorological variations in cosmic-ray intensity, 1151. Meteorological effects on cosmic ray intensity and the meson spectrum, 8004. The sudden increase in cosmic ray intensity, November 19, 1949, 8005

Rose, F. On the question of the resistive layer in copper-oxide rectifiers. I. Experiments on bulk specimens with barrier-free contacts, 8730; II. Experiments on rectifier discs, 8731

Rose, G. and Emery, E. W. Effects of solution composition in a G.–M. counter for liquid samples, 9546

Rose, J. W. Angular distribution of photons in showers in lead, 6304

Rose, M. E. A note on Dirac central field wave functions, 5111. *See also* Arfken, G. B., 9677; Biedenharn, L. C., 8156, 8172, 8948

Rose, M. E., Goertzel, G. H., Spinrad, B. I., Harr, J. and Strong, P. The internal conversion coefficients. I. The *K* shell, 7249

Rose, M. E. and Holmes, D. K. The effect of finite nuclear size in beta-decay, 7236

Rose, M. E. and Newton, R. R. Properties of Dirac wave functions in a central field, 5130

Rose, W. Packless valve flow regulator, 130

Roseau, M. The wave motion of the sea at a beach, 1647, 3377–8, 4147

Roseborough, W. D., McCue, J. J. G., Preston, W. M. and Goodman, C. The reaction $C^{14}(p, n)\ N^{14}$: excited states in N^{15}, 8965

Rosen, B. *See* Migeotte, P., 200

Rosen, J. B. and Winsche, W. E. The admittance concept in the kinetics of chromatography, 2426

Rosen, L. *See also* Allred, L. C., 4988, 8189–90, 8972

Rosen, L. and Allred, J. C. The scattering of 10·4 MeV deuterons by hydrogen, 8188. *See also* Freier, G. D., 605; Moseley, H. M., 854

Rosen, N. Particle spin and rotation, 5112

Rosen, P. The repulsive potential of normal helium atoms, 557. *See also* Stuart, G. W., Jr, 3653

Rosenbaum, E. J. Ultraviolet absorption spectrophotometry, 3895. *See also* Lauer, J. L., 6890

Rosenbaum, J. H. *See* MacGillavry, D., 9113

Rosenbaum, P. J. *See* Meschan, I., 4977

Rosenberg, H. *See* Ennor, A. H., 9652

Rosenblatt, M. A. *See* Rozenblat, M. A.

Rosenblith, W. A. *See also* Rosenzweig, M. R., 2259

Rosenblith, W. A. and Rosenzweig, M. R. Electrical responses to acoustic clicks: influence of electrode location in cats, 9875

Rosenblum, S. *See also* Franzinetti, C., 462

Rosenblum, S. and Valadares, M. The internal conversion spectrum of the transition ionium→radium, 4683

Rosenbluth, M. N. High energy elastic scattering of electrons on protons, 373

Rosenbrock, H. H. and Tagg, J. R. Wind- and gust-measuring instruments developed for a wind-power survey, 760, 9196

Rosenfeld, A. H. *See* Marshall, L., 7274

Rosenfeld, L. Early history of quantum mechanics, 1598. Meson fields and nuclear forces, 5113. Electromagnetic properties of nuclei and nuclear structure, 7179

Rosenqvist, I. T. Diffusion in crystalline silicates, 4775

Rosenthal, I. L. *See* Rozental, I. L.

Rosenthal, L. A. *See also* Freedman, L. A., 2659

Rosenthal, L. A. and Zablocki, H. S. An electronic a.c. differential voltmeter, 1196

Rosentsweig, I. Yu. *See* Rozentsweig, I. Yu.

Rosenzweig, M.-R. *See also* Rosenblith, W. A., 9875

Rosenzweig, M. R. and Rosenblith, W. A. Some electrophysiological correlates of the perception of successive clicks, 2259

Roser, F. X. *See also* Bowen, T., 8228

Roser, F. X. and Bowen, T. The problem of using scintillation crystals as proportional counters for high energy particles, 5497

Roshdestvenskiĭ, B. L. Waves in a flat speaking tube, 6794

Rosini, E. *See* Giorgi, M., 3218

Rosino, L. Physical characteristics of some classes of variable stars, 3299

Rösler, U. and Schubert, K. Crystal structure of $PtPb_4$, 9830

Ross, I. G. *See also* Parr, R. G., 2901

Ross, I. G. and Sack, R. A. Solvent effects in dipole moment measurements, 1037

Ross, I. M. and Johnson, F. B. A sensitive method of recording nuclear induction signals, 4612

Ross, J. D. *See* Beams, J. W., 4122

Ross, J. S. *See* Mack, J. E., 8141; Murkawa, K., 7186

Ross, M. A. S. *See* Jarvis, C. J. D., 6419

Ross, W. Direction of arrival of ionospheric radio waves, 2873. *See also* Bramley, E. N., 8068

Ross, W., Bramley, E. N. and Ashwell, G. E. A phase-comparison method of measuring the direction of arrival of ionospheric radio waves, 7135

Rossby, C.-G. On the vertical and horizontal concentration of momentum in air and ocean currents. I. Introductory comments and basic principles, with particular reference to the vertical concentration of momentum in ocean currents, 6639

Rossel, J. *See* Ess, H., 1125; Hänni, H., 620

Rosseland, S. On the luminosity-velocity relation of Cepheids, 5047

Rosser, J. B. Transformations to speed the convergence of series, 3254

Rosser, W. G. V. *See also* Rochester, G. D., 7058

Rosser, W. G. V. and Swift, M. W. The attenuation of nucleon cascades in lead, 8016

Rossi, B. *See* McMahon, A. J., 1167

Rossi, G. B. *See* Miller, J. F., 1870

Rossi, H. H. *See also* Failla, G., 771

Rossi, H. H. and Ellis, R. H., Jr. Dosimetry of thin polonium sources, 1987. Distributed beta sources in uniformly absorbing media. II, 2009

Rössler, F. The re-absorption of radiation in high pressure Hg discharges, 7683. *See also* Behrens, H., 6108

Rossum, L. Van. *See* Van Rossum, L.

Rostagni, A. Radioactivity of potassium and the age of the earth, 3961. *See also* Ceccarelli, M., 2944, 3722

Rostoker, N. *See also* Pugh, E. M., 1955

Rostoker, N. and Pugh, E. M. On the Hall effect in ferromagnetics, 5622

Rotariu, G. J. Studies of Zeeman effects from solutions of europium and neodymium salts, 7739. *See also* Hildebrand, J. H., 7809

Rotariu, G. J., Schramke, E., Gilman, T. S. and Hildebrand, J. H. The solubility of mercury in liquid phosphorus, 7603

Rotblat, J. The cyclotron, 3578. Range-energy relation for protons and alpha-particles in photographic emulsions for nuclear research, 6270. Angular distributions of protons from the reaction $^{12}C(d, p)\,^{13}C$, 8191. Photographic emulsion technique, 9896. *See also* Blundell, M., 3699, 6671; Burrows, H. B., 3017

Roth, E. *See* Moch, R., 1112

Rotherham, L. Creep of metals, 6515

Rotherham, L. and Larke, L. W. Creep deformation of metals, 688

Roth-Meyer, H. Variation of the microhardness of single crystals as a function of the orientation of a pyramidal indenter, 2111

Rotta, J. Statistical theory of non-homogeneous turbulence, 7590

Rottier, P. B. and Jansen, M. T. Attempt at a non-vibrating table for recording the Brownian movement of a galvanometer, 8588

Roubine, E. On the calculation of the field produced by a helicoidal circuit, 3645. On the waves guided by helicoidal circuits, 7119. General expression of the electromagnetic field of a helix, 8052

Roughton, F. J. W. *See* Pinsent, B. R. W., 9050

Roulston, K. I. A simple differential pulse height analyzer, 1887

Rounthwaite, C. *See* Leah, A. S., 2638

Rouse, A. G. *See* Potter, C. A., 8640

Rouse, G. I. *See* Forman, R., 3600

Rousset, A. *See* Keramsi, S., 9402

Routly, P. McR. *See* Cohen, R. S., 1059; Wolfe, B., 795

Rouvina, J. Proton-proton scattering at 3·4, 6·8 and 7·5 MeV, 4452

Roux, E. and Husson, C. Elimination of the errors due to variations of the continuous background in quantitative spectrography, 1472

Roux, M. *See* Chalvet, O., 8086

Rovinskiĭ, V. M. and Tyzhnova, N. V. The elastic limit as established by X-ray analysis, 3100

Row, O. *See* Mukherjee, N. R., 7309

Rowan, J. W. *See* Forziati, F. H., 3441

Rowland, P. R. The shaping of metal crystals, 4893

Rowlinson, J. S. The lattice energy of ice and the second virial coefficient of water vapour, 4571. The third virial coefficients of polar gases, 6791. The critical constants of polar gases, 6792. *See also* Lambert, J. D., 1672
Roxburgh, J. M. and Winkler, C. A. Studies on the surface areas of cadmium and copper and the mechanism of cadmium polarization, 695
Roy, M. The effect of irreversibilities in a cylindrical burner tube, 888
Roy, R. *See* Banerjee, B. M., 3968
Roy, R. R. Emission of protons from the compound nucleus F^{18}, 4697. *See also* Ollano, Z. M. I., 3761
Roy, S. K. *See* Krishnan, K. S., 7379
Royer, H. The study of transparent objects with gradual phase variations by the method of phase contrast, 6916
Royer, L. New observations of epitaxial grouping between different kinds of crystals, 6562
Roys, P. A. *See* Bennett, W. E., 4696
Rozenberg, L. D. On the focusing of sound waves by a parabolic mirror, 1678
Rozenblat, M. A. Ballistic demagnetization coefficient for prismatic bars, 6356
Rozental, I. L. *See* Zatsepin, G. T., 437, 2785
Rozentsveĭg, I. Yu. *See* Shulman, A. R., 2749
Rozgachev, K. I. *See* Smolenskiĭ, G. A., 9443
Rozhanskiĭ, V. N., Amfiteatrova, T. A. and Rebinder, P. A. Peculiarities of the change of crystalline structure of a metal on deformation in surface-active media, 6511
Ruben, S. *See* Norris, T. H., 3114
Rubin, S. *See* Snyder, C. W., 1115
Rubin, T. Overvoltages at the copper electrode, 6537
Rubin, T., Johnston, H. L. and Altman, H. The temperature scale of the Ohio State University cryogenic laboratory, 8699
Ruby, L. and Richardson, J. R. Internal conversion electrons and other radiations from Cl^{34}, 2972. Radiations from F^{18}, Mo^{93}, and Cl^{34}, 8169
Ruby, W. R. *See* Julian, D. B., 1466
Ruch, F. *See* Thorell, B., 6131
Rüchardt, E. *See* Brandmüller, J., 559
Rudall, K. M. Fundamental structures in biological systems, 6655. *See also* Darmon, S. E., 7732
Rüdenberg, K. On the theory of strong coupling between nucleons and pseudovector mesons, 6744
Rudenko, N. S. *See* Verkin, B. I., 488, 3624, 9601
Ruder, R. C. *See* Simnad, M. T., 9041
Ruderman, I. W. *See* Heindl, C., 9730
Ruderman, M. *See* Finkelstein, R., 6742
Rudik, A. *See* Ioffe, B., 6448
Rudin, R. *See* Blau, M., 3759
Rudnick, I. *See* Lawhead, R. B., 8592–3
Rueger, L. J. *See also* Lyons, H., 4268
Rueger, L. J., Lyons, H. and Nuckolls, R. G. A high temperature, broad-band Stark cell for microwave spectroscopy, 6867
Ruff, H. R. *See* Winch, G. T., 1782, 1790
Rugg, F. M., Calvert, W. L. and Smith, J. J. The design and performance of a double-beam infrared spectrophotometer, 4238
Rumer, Yu. B. Periodic relation between the magnetic permeability and the field at low temperatures, 3625. Action as coordinate of space. IV, 6724. Thermodynamics of the Bose gas, 7566
Rumpel, W. F. *See* Boyd, C. A., 5165
Rumsey, N. J. On the extension of a system for differential correction of lens systems to include second-order terms, 4227
Runcorn, S. K. The main geomagnetic field, 757. Geomagnetic secular change and thermal convection in the earth's core, 3219. Heat flow in the earth (conf. rep.), 3219. *See also* Lowes, F. J., 7399
Rundle, G. P. *See* Caplehorn, W. F., 6484
Rundle, R. E. The hydrogen positions in uranium hydride by neutron diffraction, 9838. *See also* Godycki, L. E., 9179; Snow, A. I., 9178
Rupert, C. S. *See* Taylor, J. H., 8616
Rusakov, A A. and Zhdanov, G. S. The crystal structure and chemical formula of the titanium oxide Ti_3O_5 (anosovite), 6582
Rushbrooke, G. S. *See also* Carlson, B. C., 4
Rushbrooke, G. S. and Scoins, H. I. Born and Green's theory of imperfect gases, 4174. On virial coefficients and the Born–Green theory of fluids, 6776
Russel, K. *See* Hart, R. J., 5488
Russell, B. R. and Wanlig, C. A new method for the measurement of Hall coefficients, 4564
Russell, H. N. The arc and spark spectra of gadolinium, 944. Estimation of ionization potentials by comparison with neighbouring elements, 1251
Russell, K. E. *See* Axford, D. W. E., 6859
Rust, H. H. The production of ultrasonic waves by electrostriction, 156. Electroacoustic transformation caused by magnetostriction with special consideration of the radiation from practical transformers, 3413. Generation of ultrasonics by means of volume magnetostriction, 5201. Quartz ultrasonic generator of high output, 7640. *See also* Hagen, C., 4153; Haul, R., 2423
Rutgers, G. A. W. A new absolute radiometer, 5225. The second radiation constant in Planck's radiation formula. II, 5226
Ruth, R. P. *See* Rank, D. H., 5319
Rutherford, D. E. *See* Mitchell, A. R., 6075
Rutishauser, H., Speiser, A. and Stiefel, E. Programmed digital calculators (electronic calculating machines). A general survey. I, 783; II, 2296; III, 4999; IV, 5976
Rutland, D. F. *See* Gilvarry, J. J., 7971
Rutledge, W. C. *See* Cork, J. M., 573, 577, 2017, 4647, 4677
Ruud, I. The theory of direct contraction, 4913
Ruze, J. and Young, M. Experimental determination of the reflection coefficient of metal-plate media, 3659
Ryan, A. H. *See* Garstens, M. A., 4532
Ryan, L. F. Experiments on aerodynamic cooling, 9335
Rydbeck, O. E. H. Magneto-ionic triple splitting of ionospheric waves, 1205. The theory of magneto ionic triple splitting, 7129, 9622
Ryder, E. J. *See also* McAfee, K, B., 7897
Ryder, E. J. and Shockley, W. Mobilities of electrons in high electric fields, 3520
Ryerson, J. L. The solution of differential equations by electrical analog computors, 4035
Ryle, M. Radio astronomy, 23
Ryle, M. and Hewish, A. The effects of the terrestrial ionosphere on the radio waves from discrete sources in the galaxy, 3271
Ryle, M., Smith, F. G. and Elsmore, B. A preliminary survey of the radio stars in the Northern Hemisphere, 9234
Rynders, G. F. *See* Hubbard, D., 3142
Ryter, C. *See also* Lacroix, R., 1185
Ryter, C. and Extermann, R. Faraday effect of cm waves. Resonance phenomena, 7138
Ryter, C., Lacroix, R. and Extermann, R. Faraday effect of cm waves, 951
Ryter, C. E. *See* Lacroix, R. P., 2837
Ryu, N. On the depolarization of electrons by multiple scattering and reflection-transmission effect, 2747. *See also* Shinohara, K., 372
Ryvkin, S. M. Fundamental investigation of photoconductivity. I. Definition of the problem and the method of research, 1839. *See also* Zhuze, V. P., 1840, 6221
Rzymkowski, J. Production of coloured photographic images by electrolysis or electrosynthesis, 2269
Rzewuski, J. On the interaction of particles in Feynman's theory, 7527. The self-energy of scalar mesons in interaction with nuclei, 7541. Statistical interpretation of the Klein–Gordon equation, 7552. *See also* Rayski, J., 7526

Saakyan, G. S. The influence of the size of the nucleus on the retardation radiation, 8121. The influence of the dissociation of the nucleon on the elastic scattering of electrons, 8772
Saar, E. Model experiments on the drop model of the atomic nucleus, 5653
Sabato, J. A. The origin of solar energy according to Bethe's theory, 6687
Sabey, B. E. *See* Giles, C. G., 8417
Sabin, R. *See* Winckler, J. R., 451
Sacconi, L. Indirect spectrometry, 8328
Sacerdote, G. G. *See also* Bressi, A., 6820; Tutino, C., 5222
Sacerdote, G. G. and Gigli, A. Absorption of sound by resonant panels, 5191

Sachs, A. *See also* Chedester, C., 7288

Sachs, A. and Steinberger, J. Neutral mesons produced in the capture of π-mesons in hydrogen, 7290

Sachs, D. C. and Richardson, J. R. The absolute energy loss of 18-Mev protons in various materials, 7956

Sachs, R. G. *See also* Austern, N., 4095

Sachs, R. G. and Austern, N. Consequences of gauge invariance for radiative transitions, 4094

Sachs, R. G. and Dexter, D. L. Quantum limits of the electrostatic image force theory, 1031

Sachs, R. G. and Foldy, L. L. The scattering of gamma-rays by nucleons, 2988

Sack, R. A. *See* Meakins, R. J., 8722; Ross, I. G., 1037

Sadanaga, R. The crystal structure of potassium sodium *dl*-tartrate tetrahydrate, $KNaC_4H_4O_6.4H_2O$, 1514. *See also* Ito, T., 9147, 9159

Sadowsky, M. A. *See* Sternberg, E., 9744

Sáenz, A. W. Determination of residual stresses of quenching origin in solid and concentric hollow cylinders from interferometric observations, 667. On time-independent integrals of motion of the one-body problem in Dirac theory, 844. *See also* O'Rourke, R. C., 3815

Safary, E. *See also* Romand, J., 1731

Safary, E., Romand, J. and Vodar, B. Ultraviolet absorption spectrum of gaseous hydrogen fluoride, 5288

Safary, E., Vodar, B. and Coulon, R. Infra-red absorption and Raman spectra of hydrofluoric acid, 9374

Safonov, G. *See* Glaser, D. A., 1905

Sagane, R. Resonance phenomena in (γ, n), (γ, p) and $(\gamma, 2n)$ reactions measured by the technique of simultaneous activation, 7273

Sagane, R., Gardner, W. L., Hubbard, H. W. Energy spectrum of the electrons from μ^+ meson decay, 6476

Sagar, A. *See* Sundaram, P. N., 1888

Saha, M. N. Occurrence of stripped nuclei of neon in primary cosmic rays, 6296

Saha, M. N., Banerjea, B. K. and Guha, U. C. Vertical propagation of electromagnetic waves in the ionosphere, 8860

Saharia, V. N. *See* Srivastava, B. N., 1111

Saidel, L. J., Goldfarb, A. R. and Kalt, W. B. False absorption bands in the region of 200–230 $m\mu$ caused by stray radiation in the Beckman spectrophotometer, 7689

Sailor, V. L. and Floyd, J. J. The radioactive decay of Ca^{41}, 7215

Saito, H. *See* Kubota, H., 7786

Saitô, N. An interpretation of the piezoelectric loss due to the rotation of dipoles, 8725

Saito, O. and Amemiya, A. On the solution of differential equations of the two-dimensional steady flow of compressible fluid, 132

Saji, Y. *See* Arakatsu, B., 6461

Sakai, M. Researches and developments on the spiral orbit spectrometer. I, 1099; II, 1100. On the perfect velocity focusing mass spectrograph, 1873

Sakaki, W. Electrical properties of Cu_2O, 2670

Sakata, S. and Umezawa, H. On the applicability of the method of the mixed fields in the theory of the elementary particles, 5114

Saker, E. W. *See* Gebbie, H. A., 5238

Saksena, B. D. The structure of para-di-chlorobenzene, 2563. The piezoelectric constant of zinc-sulfide, 5398. *See also* Narain, H., 7768; Rank, D. H., 7713

Saksena, B. D. and Kagarise, R. E. Formation of complexes in benzene-oxalyl chloride solutions, 7699. Rotational isomerism in oxalyl chloride (ClOC–COCl), 7715. The ultraviolet spectrum of oxalyl chloride, 7716

Saksena, B. D. and Pant, L. M. The development and the surface energy of the planes of the primary rhombohedron in α-quartz, 1513. Cathode luminescence of crystalline quartz, 4289

Sakui, S. and Satô, K. On the behaviors of metals during rapid heating and rapid cooling. III, 3102

Sakurai, K. *See* Nitta, I., 9154

Sakurai, T. Electromagnetic phenomena on ribbon elements gratings, 1951. "Artificial matter" for e.m. waves, 2661. On the Stark effect of the line H_α, 3432. The theory of "metal plates dielectric," 3663. On the Stark effect of the line H_β, 5256. On the transformation of long chain acid amides, 8686. *See also* Kakiuchi, Y., 2642

Sakurai, T., Kanaya, K. and Shishido, K. The thermopile for an infra-red spectrometer and its application to a vacuum gauge, 4398

Sala, O. Psycho-physical consequences of electro-acoustic sound synthesis, 3417. *See also* Stammreich, H., 1758

Salam, A. Differential identities in three-field renormalization problem, 79. Overlapping divergences and the S-matrix, 4104

Salé, B., Serruys, M. and Vichnievsky, R. Influence of fuel richness on the critical volume-compression ratio for detonation, and comparison with experimental results, 8283

Salecker, H. Quantum electrodynamic self-energy and the exact solution of the Schrödinger equation. I, 837; II, 1606

Salka, O. *See* Norinder, H., 9505

Salley, D. J. *See* Judson, C. M., 1453, 5883

Salmon, J. Suggested automatic trajectory tracer for charged particles, 8784. *See also* Moch, R., 1112

Salmon, O. N. *See* Geller, S., 9167

Salomon, F. The selective absorption of light by the crystalline lens, 4010

Salomon, G., van der Schee, A. C., Ketelaar, J. A. A. and van Eyk, B. J. Infra-red analysis of rubber derivatives, 7728

Salomonovich, A. E. Dry friction and electric contact at small displacements, 6520. *See also* Borodovskaya, L. N., 8590

Salosin, V. T. *See* Kovner, M. A., 3687

Salpeter, E. E. Dissociation cross sections for fast hydrogen molecule ions, 1136. The effective range of nuclear forces. Effect of the potential shape, 4602. *See also* Low, F. E., 7679

Saltsburg, H. *See* Reiss, H., 2890

Salvetti, C. *See* Gallone, S., 645, 2066, 5657

Salvini, G. The mean free path of the N component of the cosmic radiation, 1902. *See also* Borsellino, A., 1909; Lovati, A., 2806

Salzberg, H. and King, C. V. The rate of corrosion of silver in solutions of ferric sulfate, 704

Salzer, H. Tables of $n!$ and $\Gamma(n + \frac{1}{2})$ for the first thousand values of n, 9228

Salzer, H. E. Checking and interpolation of functions tabulated at certain irregular logarithmic intervals, 3256

Samoĭlovich, A. G. and Konkov, V. L. Theory of galvanomagnetic effects in ferromagnetics, 6320

Sampson, A. M. D. *See* Ames, J., 3194

Sampson, M. B. *See* Schelberg, A. D., 2039; Steigert, F. E., 8789

Samsonov, G. V. *See* Zagyanskiĭ, I. L., 3192

Samuel, E. W. and Shankland, R. S. The sound field of a Straubel X-cut crystal, 155

Sanada, J. *See also* Oda, Y., 2068, 6034, 9001; Yamabe, S., 5780

Sanada, J. and Yamabe, S. On the forward scattering of $3\cdot1$-MeV neutrons by the deuteron, 3008

Sanada, J. and Yoshizawa, Y. On the binding energies of light nuclei, 8892

Sanchez Serrano, E. Radioactive ionization and its application to spectrochemical analysis, 8326

Sandage, A. R. and Hill, A. J. The solar curve of growth for lines of Cr I, 6700

Sandell, D. J., Jr. *See* Keyes, F. G., 251

Sander, K. F., Oatley, C. W. and Yates, J. G. Factors affecting the design of an automatic electron-trajectory tracer, 9524

Sanders, C. L. *See* Middleton, W. E. K., 6133

Sanders, J. H. *See* Allen, K. W., 5759

Sanders, J. V. and Tabor, D. Structure of thin films of aliphatic esters and alcohols on metals, 3072

Sandig, H.-U. The electrical controls of the Bamberg 60-cm reflector, 5007

Sandorfy, C. The effect of configurational interaction on the dipole moment and on transition moments. Example of the C=N group, 8107

Sandström, A. E. Semi-conducting materials. Some experimental studies of the resistance and electromotive force of selenium blocking-layer, 7871

Sänger, E. On the problem of the chemical ignition of thermal nuclear reactions, 8288

Sanghi, I., Dater, D. S. and Zaheer, S. H. Relationship between conductivity of the system ethanol + water + sulfuric acid and the solvent composition, 2128

Sanner, H.-G. Investigation into the spectral sensitivity of selenium photocells, 316

Santangelo, M. *See* Festa, C., 1990, 3226

Santen, J. H. van. *See* van Santen, J. H.

Santoro, M. Average value of periodic functions, 3253

Sanyal, S. B. On the Raman spectra of three monosubstituted *n*-butane compounds in the solid state, 3461

Saraga, L. Desorption of soluble surface layers maintained at constant area, 7598

Sard, R. D., Crouch, M. F., Jones, D. R., Conforto, A. M. and Stearns, B. F. Neutron production by cosmic-ray particles at sea level and underground, 8012

Sargent, B. W. Detection of slow neutrons, 9728

Sarma, M. R. *See* Butler, O. I., 1940, 6355

Sasajima, H. New vorticity transfer theory, 7591

Sasaki, M. *See* Nakamura, S., 5115; Taketani, M., 5106

Sasaki, S. *See* Ozaki, S., 84

Sastri, M. V. C. and Srikant, H. Adsorption of hydrogen at elevated pressures on a promoted iron synthetic ammonia catalyst, 3156. Adsorption of nitrogen at elevated pressures on a promoted iron synthetic ammonia catalyst, 3158. *See also* Ghosh, J. G., 3157

Sato, H. On the theory of the formation of ferromagnetic superlattice alloys, 482. Decay of spectral components in isotropic turbulence, 4171. On the internal stress and the internal friction of metals. I. On the mechanism of fatigue, 4804; II. The change of the internal friction of Ni_3Fe during the formation of superlattice, 4805. On the extension of the nearest neighbour assumption in the theory of the superlattice and the intermetallic compound, 4897

Sato, H. and Yamamoto, H. The behaviour of Fe–Al, Fe–Si and Fe–Al–Si alloys considered from the stand point of the ferro-magnetic superlattice, 5567

Sato, I. *See* Nakabayasi, K., 8512

Sato, K. *See* Sakui, S., 3102; Shirane, G., 5390

Sato, T. Effects of the transformation process on the thermoelectric power of the superlattice alloy Cu_3Au, 1855. On some properties of the Cu–Mn alloy system, 3067. Notes on the thermoelectric properties of bismuth, 5426. Studies on the scattering of the sun's light by the earth's atmosphere, 9216

Sato, T. and Kaneko, H. Studies on selenium and its alloys (Report I): Physical properties of selenium, 6208; (Report II): Some experiments on the rectifying characteristics of [the] selenium rectifier, 7854*

Satoh, T. On the mathematical analysis of the problem of the conduction of heat when emissivity is variable, 1792

Satyanarayana, R. and Khastgir, S. R. Dielectric properties of salt solutions at ultra-high frequencies, 9444

Satyanarayanarao, S. *See* Krishnamurty, T. S. G., 1743

Sauberer, F. The spectroscopic transparency of ice, 3964

Sauer, F. M. *See* Schaaf, S. A., 3375

Sauer, J. A. *See* Hsiao, C. C., 653

Sauer, R. *See* Thilo, E., 1475

Saunders, D. W. *See* Rivlin, R. S., 5825

Saunders, P. R. *See* Berman, D. A., 9114

Saunders-Singer, A. E. *See* Barer, R., 3476

Sausville, J. W. *See* Glockler, G., 6393

Sauter, F. *See* Gerstenkorn, H., 6226

Sauvenier-Goffin, E. Note on the non-radial pulsations of a homogeneous compressible sphere, 5049

Savage, S. O. *See* Gray, T. J., 1413

Savitt, J. Recombination and attachment in the *F*-region during the eclipse of May 20, 1947, 2205

Sawada, H. *See* Ito, T., 1487

Sawada, K. Structure of electron in λ-process, 81

Sawada, S. *See also* Nomura, S., 1038, 1828, 5395

Sawada, S., Ando, R. and Nomura, S. On the ferroelectric Curie point of tungsten oxide, 6949

Sawada, S. and Nomura, S. Specific heat and thermal expansion of barium-strontium titanate ceramics, 1797. On the ferroelectric behaviour of sodium vanadate, 8715

Sawaguchi, E. *See also* Shirane, G., 2178, 5368, 8716

Sawaguchi, E., Maniwa, H. and Hoshino, S. Antiferroelectric structure of lead zirconate, 9835

Sawaragi, Y. On a graphical solution for the forced vibration of a system with non-linear restoring force, 4032

Sawyer, K. F. and Walton, W. H. The "Conifuge"—a size-separating sampling device for airborne particles, 654

Sax, K. The cytological effects of low intensity radiation, 1548

Saxena, A. P. and Karmalkar, P. K. "Joshi effect" in iodine vapour under X-rays, 1076

Saxon, D. Window correction curves and the shape of beta-spectra, 4661

Saxon, D. S. *See* Baños, A., Jr, 2857

Sayag, G.-J. Measurement of the ratio of the activities of U^{235} and U^{234} in natural uranium by means of an ionization chamber with a grid, 8161

Sayce, L. A. *See* Dew, G. D., 6149

Sayers, N. D. *See* Emeléus, K. G., 537

Sayle, E. A. *See* Owen, R. B., 4471

Sayre, D. The calculation of structure factors by Fourier summation, 9137

Scaff, J. H. *See* Theierer, H. C., 3523

Scarrott, G. G. Electronic circuits for nuclear detectors, 9556. *See also* Frank, S. G. F., 7975; Hutchinson, G. W., 7976

Schaaf, S. A. and Sauer, F. M. A note on the tangential transfer of energy between wind and waves, 3375

Schaaffs, W. The production of diffraction effects from polycrystalline material using an X-ray flash tube, 3913. Investigations on the velocity of sound and nature of the medium. I. The velocities of sound in organic liquids, 9312; II. The relationships between the velocity and molecular structure. Their applications to pure hydrocarbons, 9313; III. The relationships between velocity of sound and molecular structure for hydrocarbons with oxygen, nitrogen and halogen atoms, 9314; IV. Velocity of sound and dipole moment, 9315

Schachenmeier, R. Investigations on the influence of the troposphere on the propagation of ultra-short waves, 3666. On the quantum theory of superconductivity, 4397. The diffraction of electromagnetic waves around the earth in an optically inhomogenous medium, 8858

Schaefer, V. J. The effects produced by seeding supercooled clouds with dry ice and silver iodide, 4940. *See also* Reynolds, S. E., 5940

Schaeffer, O. A. The effect of isotopic substitution on mass spectra of molecules, 2934. The effect of mass discrimination on isotope abundance measurements. Relative abundance of krypton isotopes, 3714. *See also* Katcoff, S., 5696

Schaetti, N. Electron multipliers, 6971

Schaetti, N. and Baumgartner, W. The photo-effect of alkali-germanium compounds, 317

Schafroth, M. R. Higher approximations to the Klein–Nishina formula from radiation theory. II, 1298

Schall, R. On the detonation of secondary explosives by an electric spark, 4833

Schall, R. and Thomer, G. X-ray flash photographs of shock waves in solid, liquid and gaseous media, 5183

Scharff-Goldhaber, G. *See also* Deutsch, M. 9664; Friedlander, G., 2984; Goldhaber, M., 8920

Scharff-Goldhaber, G., der Mateosian, E., Goldhaber, M., Johnson, G. W. and McKeown, M. Two-step isomeric transition in Sn^{119m} (250 days), 8919

Scharff-Goldhaber, G. and McKeown, M. Study of low-energy gamma-radiations emitted from Pa^{231} and U^{234}, 6435

Scharmann, A. *See* Hanle, W., 6882

Schatzman, E. On the abundance of large interstellar clouds, 4043. Remarks on the nova phenomenon. III, 4054. On scattering particles in the atmosphere of Mars, 5016. The isotope ^3He in stars. Application to the theory of novae and white dwarfs, 5996. *See also* Barbin, M., 819; Dumézil-Curien, P., 6717

Schawlow, A. L. *See also* Crawford, M. F., 2927

Schawlow, A. L. and Townes, C. H. Nuclear magnetic moments and similarity between neutron and proton states in the nucleus, 5667

Schecter, L. Angular distribution of neutrons from targets bombarded by 20 MeV deuterons, 8195

Schedling, J. A. A repetition of Oersted's researches, in which metallic particles with six degrees of freedom were used in place of a magnetic needle, 510. *See also* Blaha, F., 2825

Schee, A. C. van der. *See* van der Schee, A. C.

Scheer, M. *See* Kulenkampff, H., 5467

Scheffé, H. Theoretical backgrounds of the statistical methods, 8430

Scheibe, A. and Adelsberger, U. The phase of the earth's (periodic time) error, 6010

Scheibner, E. J. *See* Schulz, L. G., 1762

Scheidegger, A. E. On the connection between field equations and equations of motion, 3321. Gravitational transverse-transverse waves, 6726. *See also* Infeld, L., 6722

Scheidegger, A. E. and McKay, C. D. Quantum statistics of fields, 6732; Erratum, 9266

Scheidegger, R. *See* Nowacki, W., 1509

Schein, M. *See* Berger, M. J., 8785; Gottlieb, M. B., 434; Lord, J. J., 459, 1316, 1916, 2810; Vidale, M., 6307

Schelberg, A. D., Sampson, M. B. and Cochran, R. G. Angular distribution of the Al^{27}(d, α)Mg^{25} reaction and energy levels in Mg^{25}, 2039

Schelkunoff, S. A. Kirchhoff's formula, its vector analogue, and other field equivalence theorems, 9616. Remarks concerning wave propagation in stratified media, 9620

Schendell, G. The measurement with the microscope of inaccessible dimensions of macroscopic bodies, 1632

Schenk, J. *See* Prins, J. A., 8682

Schepler, H. C. Development of an aspheric lens surface, 173

Scheraga, H. A. Effect of a Gaussian distribution on flow birefringence, 7787

Scheraga, H. A., Edsall, J. T. and Gadd, J. O., Jr. Double refraction of flow: numerical evaluation of extinction angle and birefringence as a function of velocity gradient, 8664

Scherb, M. V. *See* Mandeville, C. E., 3582

Scherer, H. *See* Hanle, W., 5984, 8646

Schérer, M. *See also* Hamelin, J., 4505, 5525

Schérer, M. and Vieille, E. The propagation of the discharge in a G.M. counter with external electrode, 1121

Scherrer, P. *See* Hanouda, I., 9000; Jordan, P., 6414; Lüscher, E., 621

Scherrer, W. On the influence of the metric field on a scalar matter-field, 825

Schick, A. F. and Singer, S. J. On the concentration dependence of the rates of diffusion of macromolecules in solution. An investigation of fractions of polystyrene, 1650

Schiff, H. I. *See* Butler, J. P., 7346

Schiff, L. I. Energy-angle distribution of thin-target bremsstrahlung, 7020. Nonlinear meson theory of nuclear forces. I. Neutral scalar mesons with point-contact repulsion, 9279; II. Nonlinearity in the meson-nucleon coupling, 9280. *See also* Post, R. F., 3588

Schiffman, T. *See* Ekstein, H., 9341

Schilberg, L. E. *See* Rogers, F. T., Jr, 3367

Schild, A. Discrete space-time and integral Lorentz transformations, 4073. *See also* Pirani, F. A. E., 72

Schiller, R. *See* Bergmann, P. G., 847

Schilling, G. F. and Seper, H. On the dependence of atmospheric electrical potential gradients on the (city) metropolitan location of Vienna, 3995

Schillinger, E. J., Jr, Waldman, B. and Miller, W. C. An investigation of bremsstrahlung by means of the nuclear isomerism of indium. II, 7278

Schindler, A. *See* Pugh, E. M., 1955

Schipper, E. *See* Hazel, J. F., 4858

Schirmer, H. On the propagation of shock-waves in the solar atmosphere, 33

Schissel, P. Radiofrequency mass spectrometer, 7024

Schissler, D. *See* Turkevich, J., 1405

Schittenhelm, R. *See* Kulenkampff, H., 5467

Schlacks, L. K. *See* Brolley, J. E., Jr, 8917

Schlichting, H. On the calculation of the laminar boundary layer for supersonic velocity, 9333

Schlochauer, M. and Gunning, H. E. The reaction of methylcyclopentane with Hg 6 ($^3P_1$) atoms, 4821

Schlomka, T. Ohm's law in moving bodies, 6357. *See also* Epheser, H., 3311

Schlüter, A. Dynamics of plasmas. II. Plasma with neutral gas, 5430. *See also* Biermann, L., 5029, 6680

Schmeiser, K. *See* Ritter, O., 7939

Schmeissner, F. and Meissner, H. The thermal conductivity of Chroman B2 Mo at low temperatures, 1010

Schmidt, G. M. J. A circular slide rule for structure-factor calculations, 3920. *See also* Harnik, E., 9170

Schmidt, H. A note on the question of interstellar absorption in the neighbourhood of the sun, 5012

Schmitz, G. Reply to the remarks of O. Koch on the paper by G. Schmitz entitled: "On the breadth of wall-stabilized arc discharges," 358

Schmitz, G. and Hecker, W. Concerning the numerical calculation of temperature distributions in wall-stabilized arc discharges, 4401

Schmitz, G. and Koch, O. Final remarks on the paper of G. Schmitz "On the breadth of wall-stabilized arc discharges," and on the discussion following it, 4403

Schneider, C. S. *See* Murray, W. D., 3966

Schneider, E. E. *See also* England, T. S., 496

Schneider, E. E. and England, T. S. Paramagnetic resonance at large magnetic dilutions, 7091

Schneider, H. *See* Hanle, W., 8797; Huber, O., 5698; Medicus, H., 4642

Schneider, W. G. Ultrasonic absorption in the critical temperature region, 907. Sound velocity and sound absorption in the critical temperature region, 4183. *See also* Atack, D., 1799; MacCormack, K. E., 127, 279, 6789, 7608

Schneider, W. G. and Thiessen, G. J. The velocity of sound in helium at temperatures 78°c to 200°c and pressures up to 70 atmospheres, 902

Schnurmann, R. Summarized proceedings of a conference on the physics of lubrication—Manchester, 1950 (conf. rep.), 866. The electrostatic component of the force of friction, 3844. *See also* Maddams, W. F., 6862; Morris, W. J., 3364

Schoen, A. L. and Davis, R. H. An alignment chart for computing the thickness of evaporated films, 6496

Schoen, L. *See* Murphy, G. M., 4242

Schoenberg, M. D., Riseman, J. and Eirich, F. R. Extinction angles, intrinsic viscosities, and molecular weights of polystyrene in solution, 1439

Schoenfeld, R. L. *See* Tobin, M. W., 4362

Schoening, F. R. L. *See* van Niekerk, J. N., 2182, 8762

Schofield, F. A new method of preparing paste and powder specimens for the electron microscope, 3083

Schofield, T. H. *See* Allen, N. P., 9746

Scholefield, H. H. The control and application of the expansion characteristics of metals and alloys, 3480

Scholes, G. and Weiss, J. Chemical action of ionizing radiations on nucleic acids in aqueous systems, 1434

Scholes, W. E. *See* Parkin, P. H., 3421

Scholte, J. W. A. *See* van Geel, W. C., 4368

Scholte, T. G. *See* Böttcher, C. J. F., 5861

Schomaker, V. Length of central bond in thiophthen, 3881. *See also* Jones, M. E., 4905; Simonetta, M., 5886

Schön, M. Remarks on the interpretation of the "glow curves" of crystal phosphors, 7759. On the radiationless transitions in sulphide phosphors, 7760. Activator levels in the band model of sulphide phosphors, 8648

Schönberg, M. Mechanism of the loss of energy by collisions in a material medium. I. 3573. On perturbation theory in quantum mechanics. I. Discontinuous spectra, 7555; II. Continuous and mixed spectra, 9282. Physical applications of the resolvent operators. I. On the mathematical formalism of Feynman's theory of the positron, 9264

Schönfeld, J. C. Propagation of tides and similar waves, 7593

Schonland, B. F. J. *See also* Malan, D. J., 5432, 9856

Schonland, B. F. J. and Malan, D. J. The distribution of electricity in thunderclouds, 9855

Schöntag, A. On the dependence of the position of spectral lines on the temperature of the spectrograph and its effect on qualitative and quantitative analysis, 9800

Schöntag, A. and Camerer, L. Influence of the air pressure on the intensity ratio of two spectral lines and on the disintegration of the electrodes in the quantitative spectroscopy of alloys, 5242

Schoone, J. C. *See* Bokhoven, C., 6598

Schopper, E., Höcker, K. H. and Kuhn, G. Transition effects of star-producing cosmic radiation in lead, 6310. Secondary nucleons in lead, 6311

Schopper, H. Determination of the energy distribution of β-spectra from an absorption measurement, 7230. *See also* Fleischmann, R., 5311

Schorr, M. G. and Farmer, E. C. Scintillation pulse sizes of solid noncrystalline-type phosphors, 4292

Schorr, M. G. and Torney, F. L. Solid non-crystalline scintillation phosphors, 1750

Schouten, J. P. Fields in and around slots in a magnetic medium, the mechanical forces acting upon the latter in the magnetic field due to an electric current in the slot and the movement of the electric field due to the slot, 1193

Schrader, A. Electron optical investigation of the structure of banded pearlite and of pearlite structure in a Cr magnet steel, 3809

Schrader, E. F. A high-speed short resolving time coincidence circuit for use with scintillation counters, 1132

Schrader, R. and Wirtz, K. Density and molecular volume of heavy water between 20° and 100°c, 7585

Schramke, E. *See* Rotariu, G. J., 7603

Schreiber, H. and Degner, W. Method of making ultrasonic waves visible, 160

Schremp, F. W., Ferry, J. D. and Evans, W. W. Mechanical properties of substances of high molecular weight. IX. Non-Newtonian flow and stress relaxation in concentrated polyisobutylene and polystyrene solutions, 6054

Schriever, W. Space charge in electrolytes during electrolysis. A reply, 9770

Schriever, W. and Ferguson, E. E. Macroscopic space charge in a potassium chloride solution during electrolysis, 5864

Schröder, H. The light distribution functions of multiple-layers and their applications, 5318

Schrödinger, E. Irreversibility, 281. Studies in the non-symmetric generalization of the theory of gravitation. I, 6019. On the differential identities of an affinity, 6723. *See also* Papapetrou, A., 7504

Schroeder, C. A. *See* Bergstralh, T. A., 3615

Schroeder, H. P. *See* Harris, S. P., 2073

Schroyer, F. K. *See* Selwood, P. W., 1404

Schubert, K. *See also* Rösler, U., 9830

Schubert, K. and Anderko, K. Crystal structure of CuMg$_2$, 4909. Crystal structure of NiMg$_2$ and AuMg$_3$, 9145

Schuette, O. F., Jr, Zucker, A. and Watson, W. W. Apparatus for concentration of He^3 by thermal diffusion, 3713

Schüler, H. and Reinebeck, L. Behaviour of the "blue" spectrum of benzaldehyde, 948. Formaldehyde spectrum in the glow discharge, 3444. Method for the variation of the activation conditions of organic substances in the glow discharge, 3546. New spectra in the glow discharge in benzene vapour, 6110. On a new spectrum of a glow discharge in naphthalene vapour, 7686

Schull, H. Theoretical computations of transition probabilities for electronic spectra of C_2 and N_2^+, 185

Schulman, J. H. *See also* Klick, C. C., 220

Schulman, J. H., Ginther, R. J. and Klick, C. C. Some optical properties of lead-activated sodium chloride phosphors, 2559

Schulman, J. H. and Klick, C. C. On the fluorescence and phosphorescence emission spectra of manganese-activated zinc silicate, 971

Schultheiss, P. M. *See* Reich, H. J., 7890

Schultz, H. L. and Wadey, W. G. The Yale linear electron accelerator, 7932

Schultz, W. The energy lost by fast electons traversing foils (multiple scattering), 7015

Schulz, A. *See* Jakobson, M., 4752

Schulz, G. *See* Coolidge, J. E., 2656

Schulz, H. Notes on the definition of anallactic points, 6826. On the brightness-attenuation of photographic objectives, 8411

Schulz, I. *See* Adolph, R., 4177

Schulz, L. G. An interferometric method for accurate thickness measurements of thin evaporated films, 1767. The effect of phase changes in white light interferometry, 4308. Polymorphism of RbBr, 4891

Schulz, L. G. and Scheibner, E. J. An experimental study of the change in phase accompanying reflection of light from thin evaporated films, 1762

Schulz-Du Bois, E. *See* Honerjäger, R., 351

Schulze-Pillot, G. and Bothe, W. The single scattering of fast electrons at small angles, 1105

Schumann, W. O. Electric waves in moving plasms, 1200. Propagation of electric waves along stratified and continuously varying plasmas, 2862. On slow electric waves in gasfilled metal tubes, 3544

Schuster, N. A. A phase-sensitive detector circuit having high balance stability, 5598

Schuster, N. A. and Pake, G. E. The electric quadrupole moment of Li^6, 3703. The spin of Be^9, 5655

Schutten, J. *See* Reinders, M. E., 9331

Schutzenberger, M. P. On the relations between the quantity of information in Fisher's sense and in Wiener's sense, 5005. A generalization of the idea of valuation for given lattices and its application to the distributions of quantum statistics, 6757

Schützer, W. and Tiomno, J. On the connection of the scattering and derivative matrices with causality, 6749

Schwab, G.-M. Alloy catalysts in dehydrogenation, 1420

Schwachheim, G. *See* Meyer, H. A., 5530, 9569

Schwartz, C. M. *See* Austin, A. E., 6502

Schwartz, H. M. and Edwards, R. R. Orbital perturbation effects in beta-decay, 5674

Schwartz, R. S. *See* Post, B., 5912

Schwarz, G. *See* Bearden, J. A., 1084

Schwarzkopf, P. The structure of hardmetals, 3680

Schwarzl, F. *See* Urban, P., 8519

Schweckendiek, O. E. On the behaviour of iron oxide aerosols, 712

Schwed, P. *See* Levy, G. B., 241

Schweitzer, F. E. and Van Artsdalen, E. R. Bromination of hydrocarbons. V. Neopentane and hydrogen chain lengths. Efficiency of neopentane as a third body, 8303

Schweitzer, G. K. and Garrett, J. T. A comparison of two methods for correcting for self-absorption of beta-particles, using sulfur ^{35}, 7231

Schweitzer, G. K. and Stein, B. R. Measuring solid samples of low-energy beta emitters, 2013

Schweitzer, P. H. and Szebehely, V. G. Gas evolution in liquids and cavitation, 870

Schweizer, A. A. On the deep configurations of V I and Cr II, 2508

Schwertz, F. A. and Brow, J. E. Diffusivity of water vapor in some common gases, 5166

Schwetzoff, V. *See also* Romand, J., 9802

Schwetzoff, V. and Robin, S. Spectral characteristic of Sb–Cs photocathodes in the ultra-violet down to 1 500 Å, 9481. Spectral characteristic of Sb–K and Sb–Na photocathodes in the ultra-violet down to 1 500 Å, 9482

Schwinger, J. On gauge invariance and vacuum polarization, 5082. The theory of quantized fields. I, 6731. *See also* Levine, H., 7114; Marcuvitz, N., 6365

Sciuti, S. *See* Amaldi, E., 463, 1910; Quercia, I. F., 1915

Scoins, H. I. *See* Rushbrooke, G. S., 4174, 6776

Scolnik, R. *See* Koomen, M., 4969

Scorer, R. S. Billow clouds, 9215

Scott, E. J., Tung, L. H. and Drickamer, H. G. Diffusion through an interface, 8562

Scott, G. D. *See* McLauchlan, T. A., 1349

Scott, G. G. A precise mechanical measurement of the gyromagnetic ratio of iron, 5587. Inertia of the carrier of electricity in cadmium, 7848

Scott, J. C. W. The Poynting vector in the ionosphere, 1203. Computation of propagation in the ionosphere, 1206. The gyro-frequency in the arctic *E*-layer, 6633

Scott, M. R. *See* Way, K., 2938

Scott, N. W. *See* Benson, N. C., 2083

Scott, R. and Bolam, T. R. High-frequency conductivity of paraffin-chain salts, 3137

Scott, R. B. *See* Herzfeld, K. F., 323

Scott, R. L. Directed valence in IF$_5$ and IF$_7$, 2146

Scott, T. R. and Mayer, S. E. Semi-conducting materials. Engineering and chemical aspects of semi-conductors, 7891
Scott, W. T. On a difference equation method in cosmic-ray shower theory, 1914. On fluctuations and the general distribution problem in electron cascades, 7050. *See also* O'Neill, G. F., 2729
Scott Blair, G. W. The hardness and strain-hardening of Plasticine, 6518. *See also* Reiner, M., 111
Scouloudi, H. *See* Carlisle, C. H., 7392
Scovil, H. E. D. *See* Bleaney, B., 1981, 4533, 8036
Scrase, F. J. *See* Brewer, A. W., 3965
Scribner, B. F. *See* Meggers, W. F., 5248–9
Scruby, R. E., Lacher, J. R. and Park, J. D. The infrared spectrum of boron trichloride, 4280
Seaborg, G. T. *See* Batzel, R. E., 604, 5734; Ghiorso, A., 3762, 6404; Meinke, W. W., 4653; Street, K., Jr, 565; Thompson, S. G., 2949–50
Seagert, B. The progress of wide-aperture photographic objectives (supplementary comments), 8409
Searle, G. F. C. An electro-magnetic problem, 512
Sears, W. R. Erratum: Transonic potential flow of a compressible fluid, 885
Seaton, M. J. The continuous radiative absorption cross-section of singly ionized potassium, 2931. A comparison of theory and experiment for photoionization cross-sections. I. Neon and the elements from boron to neon, 8143; II. Sodium and the alkali metals, 8144
Seban, R. A. Heat transfer to a fluid flowing turbulently between parallel walls with asymmetric wall temperatures, 253
Seban, R. A. and Shimazaki, T. T. Heat transfer to a fluid flowing turbulently in a smooth pipe with walls at constant temperature, 8681
Secoy, C. H. The application of kinetic theory to the critical curve for aqueous solutions of 1-1 electrolytes, 1800
Sedra, R. N. Intensity of ultraviolet radiation from solar flares, 7415
Seed, J. Alpha-particles from the proton bombardment of oxygen-18, 5750. *See also* Freeman, J. M., 4704
Seeds, W. E. *See* Norris, K. P., 4318
Seeger, C. L. Some observations of the variable 205 Mc/sec radiation of Cygnus A, 7457
Seeger, C. L. and Williamson, R. E. The pole of the galaxy as determined from measurements at 205 Mc/sec, 3291
Seeger, R. J. and Polachek, H. On shock-wave phenomena: waterlike substances, 5182
Seemann, H. *See* Thilo, E., 1475
Seevers, D. O. *See* Lewis, H. W., 4467
Segal, S. M. *See also* Finkelnburg, W., 7923
Segal, S. M. and Finkelnburg, W., 1072
Ségard, W. *See* Charron, E., 8658
Segedin, C. M. Note on a penny-shaped crack under shear, 5136
Segrè, E. *See also* Bakker, C. J., 4456; Chamberlain, O., 4450, 8786; Leininger, R. F., 4634
Segrè, E. and Wiegand, C. E. Erratum: Experiments on the effect of atomic electrons on the decay constant of Be^7, 4635
Sehon, A. H. *See also* Leigh, C. H., 9794; Szwarc, M., 535, 2902, 5887–8
Sehon, A. H. and Szwarc, M. The C–Br bond dissociation energy in halogenated bromomethanes, 9795
Seidel, W. and Marshak, R. E. Upper and lower bounds for the asymptotic neutron density in Milne's problem for the sphere, 3797
Seidl, F. G. P. *See* French, A. P., 5483
Seitz, F. Prismatic dislocations and prismatic punching in crystals, 737. On the formation of dislocations from vacancies, 741. Influence of plastic flow on the electrical and photographic properties of the alkali halide crystals, 1477. The generation of vacancies by dislocations, 1480. Spiral prismatic dislocations and the origin of slip-bands, 1481. Color centers in additively colored alkali halide crystals containing alkaline earth ions, 7381. *See also* Castellan, G. W., 7857
Seki, S., Momotani, M. and Nakatsu, K. Phase transition in bariumdicalcium-propionate, 7806
Sekido, Y., Masuda, T., Yoshida, S. and Wada, M. The Crab-nebula as an observed point source of cosmic rays, 8446
Sekiguchi, N. Theory of the rotation of the earth having three unequal principal moments of inertia, 7496. Motions of the rotation axis of the elastic earth relative to the earth's body and to the space, 8481
Seldam, C. A. ten. *See* ten Seldam, C. A.
Selényi, P. On the possibility of a modification and extension of Eötvös's rotated balance experiment, 7572
Seliger, H. H. A new method of radioactive standard calibration, 6400
Seliger, H. H. and Cavallo, L. The absolute standardization of radioisotopes by 4π counting, 9648
Selkin, V. A. *See* Korshunov, A. V., 2564
Selove, W. Spin dependence of neutron scattering by Na^{23}, 2067
Selvaggi, D. Stratification and nomenclature of the atmosphere, 9845
Selwood, P. W. *See also* Robertson, R. F. S., 4538; Trzebaitowski, W., 1180
Selwood, P. W. and Lyon, L. Structure of oxide catalyst systems, 1403
Selwood, P. W. and Schroyer, F. K. Proton relaxation and catalyst accessibility, 1404
Selzer, E. An amplifier of the geomagnetic field for use with magnetron and magnetophone recorders, 6611
Seman, O. I. Optical power of short electron lenses, 5456
Sémirot, P. Principles of a new transit instrument, 9233
Semishin, V. I. *See* Znoĭko, A. P., 2951
Sen, H. K. *See* Menzel, D. H., 6712–13; Feinstein, J., 7112
Sen, S. *See* Nag, B. D., 394*, 6407
Sen, S. N. On the absorption of u.h.f. radio waves by some aliphatic ketones, 7700. On the absorption of u.h.f. radio waves in some aliphatic ketones dissolved in non-polar solvents, 9445
Senent, F. *See* Senent, S., 9793
Senent, S. and Aguilar, M. Calculation of the intensity of interaction in π bonds, 6547. Interaction intensity in single, double and triple carbon-carbon bonds, 8318
Senent, S. and Senent, F. Proper functions of the directed valencies in the pure form of hybridization, 9793
Senftle, F. E. *See also* Hine, G. J., 3019
Senftle, F. E. and Gaudin, A. M. Concentration of ores by induced activities, 8153
Sengupta, S. Multiplet separation factors and Γ-sum rule, 1248. *See also* Kar, K. C., 3343
Senior, J. K. Unimerism, 7360
Sennett, R. S. *See* McLauchlan, T. A., 1349
Seper, H. *See* Schilling, G. F., 3995
Serber, R. *See* Brueckner, K., 4692
Series, G. W. A spectroscopic determination of the shift of the $3S$ term in hydrogen, 2514. The fine structure of the α-line of heavy hydrogen, 7680
Serin, B., Reynolds, C. A. and Nesbitt, L. B. Mass dependence of the superconducting transition temperature mercury, 2700
Serpe, J. On the production of mesons by photons, 4757
Serrano, E. Sanchez. *See* Sanchez Serrano, E.
Serruys, M. *See* Salé, B., 8283
Servant, R. and Loudette, P. "Hertzian" polarimeter for the study of macroscopic models of active molecules, 1946. Hertzian polarimetry of helical rotators, 3650. Macroscopic realization of a "Cotton effect" with radio-waves, 3651
Servi, I. S. and Grant, N. J. Creep and stress rupture as rate processes, 9033
Seshagiri Rao, T. *See* Bhagavantam, S., 8259; Bhamasenachar, J., 1478
Sette, D. On the ultrasonic absorption in binary mixtures of unassociated liquids, 2467. Measurements of ultrasonic absorption in various mixtures of nitrobenzene, 5188
Setti, R. L. Contribution to the methods of measurement of scattering in the photographic plate, 3580. *See also* Gerosa, A., 9582
Setti, R. L. and Merlin, M. Evaporation stars produced in metal foils, 9577
Sevchenko, A. N. and Stepanov, B. I. Influence of the water of crystallization on the fluorescence spectrum of uranyl nitrate. II, 6889

Sevchenko, A. N. and Trofimov, A. K. Investigation of the photo-luminescence of the benzoylacetonates of europium and samarium, 6881

Sevchenko, A. N., Vdovenko, V. M. and Kovaleva, T. V. Influence of the water of crystallization on the fluorescence spectrum of uranyl nitrate. I, 6888

Severin, H. Diffraction of electromagnetic centimetre-waves at circular metallic disks, 3660. On the theory of diffraction of e.m. waves, 7115

Severin, H. and v. Baeckmann, W. Diffraction of electromagnetic centimetre-waves by metallic and dielectric disks, 5603

Severn, R. T. *See* Allen, D. N. de G., 9413

Severnyĭ, A. B. Investigation of fluctuations in the luminescence of solar prominences, 812. An experiment in phosphor photography of solar protuberances in the infra-red, 3267. *See also* Mustel, E. R., 8460; Vikonov, V. B., 5994

Severnyĭ, A. B. and Gilvarg, A. B. An interference filter for the study of the sun and its application, 7454

Sevold, B. J. *See* Raeth, C. H., 7967

Sevranckx, R. *See* Géhéniau, J., 6736

Sewell, D. C. *See* Miller, R. D., 4702; Richardson, R. E., 9585

Seya, M. *See* Tanaka, Y., 6877

Seybolt, A. U., Lukesh, J. S. and White, D. W. Allotropy of beryllium, 8354

Seymour, E. F. W. *See* Hatton, J., 7906, 8130

Shabalina, E. F. *See* Drozhzhina, V. I., 2817

Shaffer, W. H. *See* Herman, R. C., 528

Shah, S. M. *See* Haselden, G. G., 9756

Shaĭn, G. A. A note on stellar associations, 1585

Shaĭn, G. A. and Gaze, V. F. On a special class of diffuse gas nebulae, 8469

Shalimova, K. V. Absorption and emission spectra of zinc oxide, 8650

Shalnev, K. K. Cavitation at surface roughnesses, 8553

Shamin Ahmad, S. *See* Ramanamurti, M. V., 2718

Shankland, R. S. *See* Samuel, E. W., 155

Shanley, T. J. B. *See* Harris, G. G., 2061

Shannon, C. E. Prediction and entropy of printed English, 3420

Shapiro, A. M. *See* Camac, M., 6449

Shapiro, E. *See* Gill, P. S., 1993, 6408; Mandeville, C. E., 7242, 8170

Shapiro, I. S. Electron conversion of gamma quanta in beta decay, 591. On the O → O transition in O^{16}, 2975

Shapiro, M. M. Transition effect in Pb of the star-producing radiation in the stratosphere. II, 8015

Shapiro, M. M., Stiller, B., Birnbaum, M. and O'Dell, F. W. Transition effect in Pb of the star-producing radiation in the stratosphere. I, 8014

Shapiro, M. M. and Yagoda, H. Collimated and wide-angle meson groups in a hard-shower star, 1918

Shapley, H. Magellanic clouds. I. Transparency, 5041

Shapley, H. and Nail, V. McK. Magellanic clouds. II. Supergiant red variable stars in the small cloud, 5042

Sharaga, L. The effect of pressure and chain length on desorption, 874

Sharbaugh, A. H. *See* Coles, D. K., 6869; Shoolery, J. N., 5649

Sharma, D. Two new band systems of the AlCl molecule, 3435. A new band system of the AlBr molecule, 3436

Sharma, S. S. Thermal expansion of crystals. II. Magnetite and fluorite, 1476; III. Ammonium chloride and ammonium bromide, 3188; IV. Silver chloride, lithium fluoride and magnesium oxide, 3189

Sharpe, J. *See also* Loosemore, W. R., 6277; Taylor, D., 1123, 4464

Sharpe, J. and Stafford, G. H. The ^{12}C$(n, 2n)^{11}$C reaction in an anthracene crystal, 5809

Sharpe, J. and Taylor, D. Nuclear particle and radiation detectors. II. Counters and counting systems, 1124, 4465

Sharpe, J. W. A stereoscopic technique for use with an electron microscope, 6498

Shasherin, V. P. Problem of the speed of recording of a cathode ray oscillograph using an external camera, 7442

Shavtvalov, L. Ya. Measurement of the soft part of the β-spectrum of radioactive thorium deposit, 6426

Shaw, I. J. Some further investigations of ionospheric cross-modulation, 3670

Shaw, J. H., Chapman, R. M. and Howard, J. N. Improved map of the solar spectrum between 9 and 10μ, 814

Shaw, J. H., Chapman, R. M., Howard, J. N. and Oxholm, M. L. A grating map of the solar spectrum from 3·0 to 5·2 microns, 5034

Shaw, J. H. and Claassen, H. H. The absence of atmospheric ethylene, 4919. Water vapor absorption lines in the solar spectrum between 8μ and 13μ, 5995

Shaw, P. F. D. Some (n, γ) effects in iodobenzene, 4731. *See also* Bishop, G. R., 3773

Shaw, P. F. D. and Collie, C. H. Comparison of weak neutron fluxes by use of organic bromides, 4761

Shaw, R. F. Arithmetic operations in a binary computer, 11

Shaw, T. M. and Windle, J. J. Microwave techniques for the measurement of the dielectric constant of fibers and films of high polymers, 285. Microwave spectrum and dipole moment of methyl mercaptan, 8641

Shcherbakova, M. N. *See* Petrukhin, A. I., 387; Podgoretskiĭ, M. I., 2787

Shearer, J. Geometrical optics of concave mirrors and of combinations of mirrors, 5233

Sheberstov, V. I. Investigation of the anomalous type of ageing of photographic emulsion layers, 4018

Sheckler, A. C. Design characteristics of air proportional counters, 4462

Sheer, C. *See* Tittman, J., 3777, 8237

Sheline, R. K. The spectra and structure of iron carbonyls. II. Iron tetracarbonyl, 5277. Na^{20} from the gamma-ray bombardment of NaF, 7269

Sheline, R. K., Holtzman, R. B. and Fan, C. Y. The nuclide P^{33} and the P^{32} spectrum, 8914

Shendrik, K. K. and Siryuk, A. G. The polarization fluorescence of vapours of organic dyes, 3449

Shenker, H., Lauritzen, J. I., Jr and Corruccini, R. J. Reference tables for thermocouples, 8746

Shenstone, A. G. *See also* Meggers, W. F., 2509

Shenstone, A. G. and Wilets, L. The third spectrum of copper (Cu iii), 6842

Shepelev, A. I., Lyashenko, M. N. and Druzhinin, I. G. The optical constants of CaCl$_2$. 4H$_2$O crystals, 3187

Shepherd, W. M. On the stresses in close-coiled helical springs, 3347

Sheppard, C. W. and Householder, A. S. The mathematical basis of the interpretation of tracer experiments in closed steady-state systems, 4958

Sheppard, N. *See* Brown, J. K., 7363, 7726, 7734

Sheppard, P. A. Atmospheric turbulence (disc.), 4929

Sher, R. *See also* Stephens, W. E., 5774

Sher, R., Halpern, J. and Stephens, W. E. Thresholds of photo-neutron reactions, 3771

Sherburne, R. K. and Farnsworth, H. E. Activation of a solid nickel catalyst for the hydrogenation of ethylene by heat treatment in a high vacuum, 5858

Sheridan, J. *See also* Anderson, W. E., 4270–1

Sheridan, J. and Gordy, W. The microwave spectra and molecular structures of trifluorosilane derivatives, 7175

Sheriff, R. E. and Williams, D. Nuclear gyromagnetic ratios. III, 7185

Sherk, P. M. and Hill, R. D. The disintegration scheme of Au^{199}, 8928

Sherman, N. *See* Randall, C. A., 454

Sherr, R. *See* Franzen, W., 391

Sherrod, J., Neuberger, H. and Yerg, D. New standards for Landsberg's glass rod method of integrating ultraviolet radiation, 2197

Sherwin, C. W. Experiments on the emission of neutrinos from P^{32}, 4667. Vacuum evaporation of radioactive materials, 6922

Shevetsova, E. M. *See* Kragelskiĭ, I. V., 3105

Shibuya, Y. The variation of Young's modulus of a binary body-centred alloy caused by the formation of superlattice, 3816. *See also* Fukuroi, T., 8261

Shield, R. T. *See* Green, A. E., 9747

Shiflett, C. J., Steidletz, M. E. and Davis, W., Jr. A system for the collection and purification of radon by remote control, 1260

Shifrin, K. S. The coefficient of scattering of light on large particles, 9217. The scattering of light by large drops of water and the polarization of the light from the rainbow, 9218

Shigemitsu, Y. On experimental methods of the investigation of turbulent flow. I, 139; II, 894. On velocity fluctuations in the laminar boundary layer, I, 891
Shimada, J. *See* Kumagai, H., 7097, 9600
Shimanouchi, T., Tsuchiya, I. and Mikawa, Y. Raman spectra and normal co-ordinate treatment of methylchlorosilanes, 975
Shimazaki, T. T. *See* Seban, R. A., 8681
Shimazu, H. *See* Hara, O., 5098
Shimazu, Z. *See* Nonaka, I., 1122
Shimbo, S. *See* Wada, Y., 1671, 2431, 2464
Shimizu, H., Elsey, P. J. and McLachlan, D., Jr. A machine for synthesizing two-dimensional Fourier series in the determination of crystal structures, 1496
Shimizu, M. *See* Nakajima, S., 2627, 5358, 7816
Shineman, R. S. and King, A. J. The space group of calcium peroxide octahydrate, 2179
Shingre, M. V. *See* Paranjpe, M. M., 7785
Shinoda, G. and Tomura, T. Improved counting rate meter for X-ray measurement, 7963
Shinohara, K. and Ryu, N. Polarization of electrons, 372
Shipman, J. J. *See* Dannis, M. L., 4253
Shirai, M. *See* Yasumi, M., 6953
Shirane, G. *See also* Takagi, Y., 6494; Ueda, R., 9149
Shirane, G., Hoshino, S. and Suzuki, K. Crystal structures of lead titanate and of lead-barium titanate, 3211. X-ray study of the phase transition in lead titanate, 3929
Shirane, G. and Sato, K. Effects of mechanical pressures on the dielectric properties of polycrystalline barium-strontium-titanate, 5390
Shirane, G. and Sawaguchi, E. On the anomalous specific heat of lead titanate, 5368
Shirane, G., Sawaguchi, E. and Takagi, Y. Dielectric properties of lead zirconate, 8716
Shirane, G., Sawaguchi, E. and Takeda, A. On the phase transition in lead zirconate, 2178
Shirane, G. and Takeda, A. Volume change at three transitions in $BaTiO_3$, ceramics, 6202
Shire, E. S. Electrostatic generators. Linear accelerators, 3578
Shirmazan, M. G. and Dyakina, M. E. Hybrid orbitals for coordination numbers 7 and 9, 6381
Shively, R. R. Jr and Weyl, W. A. The color change of ferrous hydroxide upon oxidation, 9371
Shklovskiĭ, I. S. On the possibility of determining the distance of the "point" sources of galactic radiation, 800. Problems of the dissipation of planetary atmospheres, 3276. Identification of the infrared emission of the night sky with the vibration-rotation lines of the hydroxyl OH molecule, 3992. A computation of the concentration of the coronal ions in the excited quantum states, 7470. Computation of the concentration of the coronal ions in ground quantum states, 7471. Radio-stars, 8444
Shmidt, O. Yu. The origin of planets and their satellites, 1578
Shmoys, J. Diffraction of electromagnetic waves by a plane wire grating, 5601
Shmushkevich, I. *See* Ioffe, B., 6448
Shockley, W. Semi-conducting materials. New phenomena of electronic conduction in semiconductors, 7858. Electrons and holes in semiconductors, with applications to transistor electronics, 9478. *See also* Bardeen, J., 1057, 1108; Goucher, F. S., 4380; Haynes, J. R., 4381, 6959; McAfee, K. B., 7897; Ryder, E. J., 3520; Williams, H. J., 2824
Shockley, W., Sparks, M. and Teal, G. K. *p–n* junction transistors, 6965
Shoemaker, D. P. *See* Bergman, B. G. 5919
Shoemaker, F. C. *See also* Bouricius, G. M. B., 4444
Shoemaker, F. C., Faulkner, J. E., Bouricius, G. M. B., Kaufmann, S. G. and Mooring, F. P. Nuclear reactions resulting from the proton bombardment of aluminum, 8964
Shoenberg, D. de Haas–van Alphen effect in aluminium and antimony, 6326. *See also* Allen, W. D., 1850; Dingle, R. B., 1176; Lock, J. M., 8742
Shono, H. *See* Kakiuchi, Y., 8843; Kumagai, H., 7097, 9600
Shoolery, J. N. and Sharbaugh, A. H. Some molecular dipole moments determined by microwave spectroscopy, 5649
Shoolery, J. N., Shulman, R. G. and Yost, D. M. Dipole moment and electric quadrupole effects in HNCO and HNCS, 5644
Shooter, K. V. The lubrication of metals by long chain organic compounds, 3840. Frictional properties of tungsten carbide and of bonded carbides, 4808
Shore, F. J. *See also* Bendel, W. L., 8922
Shore, F. J., Bendel, W. L. and Becker, R. A. 4·4-minute radiations from Zr^{89}, 8924
Shore, P. A. *See* Andrews, H. L., 706
Short, L. N. *See* Thompson, H. W., 7706
Shorter, D. E. L. *See* Harwood, H. D., 304
Shortley, G. *See* Flanders, D. A., 780
Shorygin, P. P. Depolarization of the lines in optical Raman spectra, 8651
Shoupp, W. E. *See* Sun, K. H., 5741
Shpinel, V. S. Magnetic spectrometer of high resolving power for electron spectroscopy, 1867
Shpolskiĭ, E. V. and Ilina, A. A. Fluorescence of 3,4-benzpyrene in frozen solutions, 6880
Shrader, E. F. *See* Strough, R. I., 8849
Shrader, R. E. *See* Larach, S., 3455
Shreffler, R. G. *See* Fowler, C. M., 367
Shrum, G. M. *See* Little, D. E., 3999
Shsishido, K. *See* Sakurai, T., 4398
Shspanskaya, O. A. *See* Gindin, L. G., 3550
Shtarkov, L. N. *See* Petrukhin, A. I., 387
Shtaude, N. M. Tentative determination of the temperature of the higher layer of the terrestrial atmosphere from observations of the brightness of the twilight arc, 2211
Shturkin, D. A. and Shur, Ya. S. Magnetic structure of highly-coercive alloys. IV. Hysteresis of magnetostriction in the highly coercive alloys Alnico and Vikalloy, 8048
Shuleĭkin, V. V. The magnetic field of the earth and the world ocean, 3225
Shuler, K. E. Kinetics of OH radicals from flame emission spectra. I. Vibrational transition probabilities, intensities and equilibrium in the $^2\Sigma^+ - {}^2\Pi$ transition, 1392; erratum, 4825; II. Rotational and vibrational distribution functions and temperature determinations in the $^2\Sigma^+ - {}^2\Pi$ transition of OH, 3116; III. Total transition probabilities and the energetic distribution of OH $(^2\Sigma^+)$ and $O_2(^3\Sigma_u^-)$ in the oxy-hydrogen flame, 8287
Shull, C. G. Production of highly polarized neutron beams by Bragg reflection from ferromagnetic crystals, 4764. *See also* Wollan, E. O., 8236
Shull, C. G., Strauser, W. A. and Wollan, E. O. Neutron diffraction by paramagnetic and antiferromagnetic substances, 7072
Shull, C. G. and Wollan, E. O. Coherent scattering amplitudes as determined by neutron diffraction, 4737
Shull, C. G., Wollan, E. O. and Strauser, W. A. Magnetic structure of magnetite and its use in studying the neutron magnetic interaction, 5568
Shull, E. R. *See* Rank, D. H., 7713
Shull, F. B. *See* Keller, K. K., 4713
Shulman, A. R. and Rozentsveĭg, I. Yu. Secondary electron emission of aluminium oxide, 2749
Shulman, C. Quantum effects in the interaction between free electrons and electromagnetic fields, 5103
Shulman, R. G. *See* Shoolery, J. N., 5644
Shulman, S. *See* Leonard, B. R., Jr, 7426
Shur, Ya S. *See* Lukshin, A. A., 9592; Shturkin, D. A., 8048; Vlasov, K. B., 6344; Zotov, T. D., 2841*
Shur, Ya. S. and Baranova, N. A. Temperature magnetic hysteresis in ferromagnetics, 1934. Temperature dependence of the magnetization curves and hysteresis loops of highly coercive alloys, 2839
Shur, Ya. S. and Startseva, I. E. Influence of the thermo-magnetic treatment on the electric resistance of soft magnetic materials, 2876
Shur, Ya. S. and Vlasov, K. B. Influence of ageing on the shape of the curve of temperature-dependence of the coercive force in dynamo steel, 509
Shurcliff, W. A. Radiance amplification by multistage fluorescence system, 6135
Shure, K. and Deutsch, M. Radiations from Zr^{89}, 5715
Shutt, R. P. and Whittmore, W. L. Design of permanent magnets for cloud-chamber work, 4478
Shuttleworth, R. *See* Benson, G. C., 4892

Sibbitt, W. I. *See* Wilson, L. H., 7604

Sidhu, S. S. and Henry, C. O. Allotropy of beryllium, 753

Sidjak, N. An interferometer for the thickness measurement of thin transparent film, 8661

Siebel, M. P. L. *See* Hill, R., 8265

Sieg, L. *See* Crützen, J. L., 3110; Jost, W., 9425

Siegbahn, K. *See* Bishop, G. R., 1307, 4723; Johansson, S., 5701; Slätis, H., 587

Siegel, A. Relativistic corrections in high energy *n–p* scattering, 4743

Siegert, A. J. F. On the first passage time probability problem, 4120

Siemens, W. v. *See* v. Siemens, W.

Sienko, M. J. *See* Kupka, F., 1181

Sierichs, W. C. *See* Lindquist, C. G., 9295

Sievert, R. M. Measurements of radiation from the human body, 9654

Siksna, R. Radioactivity induced from the atmospheric air, investigated with the photographic emulsion method, 1264. Variations of large ions in atmospheric air during disturbed weather conditions, 2228. *See also* Norinder, H., 764, 2229

Silberstein, L. Paucity of quanta rendering a silver halide grain developable, 5964. Macroscopic sensitometry, opacity, and photographic density, specular and diffuse, 5965. The effect of gradual light absorption in a film of non-negligible thickness, 9394

Sillén, L. G. Theory of sorption columns, 1445. On filtration through a sorbent layer. IV. The ψ condition, a simple approach to the theory of sorption columns, 1447; V. "Final form" fronts and broadening fronts, 1448. *See also* Eksdahl, E., 1446, 6543

Silsbee, F. B. Measure for measure: some problems and paradoxes of precision, 9255

Silsbee, H. B. *See* Kolsky, H. G., 203, 1740, 5672

Silver, L. M. The precision measurement of half lives of radioactive substances, 3727

Silverman, A. *See* Camac, M., 6449; Levinthal, C., 7268

Silverman, A. and Stearns, M. Production of neutral mesons by γ-rays incident on hydrogen, 8979

Silverman, J. and Remick, A. E. Studies on alternating current electrolysis. II. Oscillographic studies, 1432

Silverman, R. A. and Kohn, W. On the cohesive energy of metallic lithium, 2880; Erratum, 5630

Silverman, S. *See* Bullock, B. W., 938

Silverman, S. R. *See* Davis, H., 4204

Silvestroni, P. Polarography of mercury, 3179

Sim, A. C. A generalization of reversion formulae with their application to non-linear differential equations, 3255

Šimáné, C. Auxiliary electronic equipment of an ionization vacuum gauge, 2440

Simchen, A. E. Polymerization under the influence of hydrogen ions, 722

Simha, R. The concentration dependence of viscosities in dilute solutions, 108

Simmons, E. L. *See* Jacobson, L. O., 7433

Simmons, J. W. and Anderson, W. E. Microwave determination of the centrifugal distortion constants of CH$_3$CL, CH$_3$Br, CH$_3$I, BrCN and ICN, 1735

Simmons, J. W. and Swan, W. O. The structure of methyl bromide from microwave spectra, 1964

Simmons, L. M. *See* Bosson, G., 1063; Gutman, F., 6756

Simnad, M. T. and Ruder, R. C. The mechanism of exchange between radioactive ions in solution and metal surfaces, 9041

Simoizaka, J. *See* Okamura, T., 8032–3

Simon, A. Bremsstrahlung in high energy nucleon-nucleon collisions, 76. *See also* Ashkin, J., 5795

Simon, D. M. A comparison of quenching distance and inflammability limit data for propane-air flames, 2618. Flame propagation. III. Theoretical consideration of the burning velocities of hydrocarbons, 3494

Simon, F. E. Some remarks concerning cooling by the mechano-caloric effect in helium, 2622. *See also* Berman, R., 1793, 9416; Parkinson, D. H., 6395; Pryce, M. H. L., 1599

Šimon, I. Spectroscopy in infrared by reflection and its use for highly absorbing substances, 5270

Šimon, I., McMahon, H. O. and Bowen, R. J. Dry metallic friction as a function of temperature between 4·2°K and 600°K, 3107; Erratum, 6519

Simonetta, M. and Schomaker, V. The calculation of coefficients of Coulomb and exchange integrals in matrix elements involving polar singlet structures, 5886

Simonot, Y. *See* Dognon, A., 7630, 8601

Simons, L. Energy of beta particles and photons from Ca^{45}, Zn^{65} and Co^{60} by absorption, 6429

Simonson, E. *See* Fritze, C., 8391

Simpson, D. M. *See* Brown, J. K., 7726

Simpson, J. A. Neutrons produced in the atmosphere by the cosmic radiations, 8830. *See also* Marton, L., 4428

Simpson, J. A., Jr. The neutrons from the nucleonic component as an indicator of changes in primary intensities, 4500. The change of cosmic-ray neutron intensity following solar disturbances, 4508

Simpson, J. H. On the static dielectric constant of dipolar solids, 7834, 8712

Simpson, O. Photoconductivity in the infra-red region of the spectrum. II. The mechanism of photoconductivity in lead telluride, 6974

Simpson, O. and Sutherland, G. B. B. M. Photoconductivity in the infra-red region of the spectrum. I. The preparation and properties of photoconductive films of lead telluride, 6974

Simpson, O. C. *See* Huizenga, J. R., 1277

Simpson, W. *See* Haward, R. N., 4837

Sinclair, R. M. *See* Walker, W. D., 8226

Sinclair, W. K. Comparison of Geiger-counter and ion-chamber methods of measuring gamma-radiation, 3751

Sinclair, W. K. and Emery, E. W. The half-life of iodine^{131} and the anomalous decay of exposed sodium iodide sources, 575

Sinclair, W. K. and Holloway, A. F. Half-lives of some radioactive isotopes, 4640

Sinclair, W. K. and Newbery, S. P. A direct reading meter for the measurement of highly active samples of gamma-emitting radioisotopes, 8155

Sinden, R. H. Some consequences of the additivity of luminosities, 2245

Sing, K. S. W. *See* Gregg, S. J., 9784–5

Singer, E. Present position of microbalance technique, 7578

Singer, J. J., Jr. *See* MacGillavry, D., 9113

Singer, S. F. The primary specific ionization and intensity of the cosmic radiation above the atmosphere at the geomagnetic equator, 1164. On the density spectrum and structure of extensive air showers, 4503. *See also* Maple, E., 7398; Van Allen, J. A., 1152

Singer, S. F., Maple, E. and Bowen, W. A., Jr. Evidence for ionosphere currents from rocket experiments near the geomagnetic equator, 8370

Singer, S. J. *See* Schick, A. F., 1650

Singh, B. *See* Om Prakash, 2604

Singh, J. A spectroscopic study of a condensed spark between copper electrodes in illuminating gas, air and carbon dioxide at various pressures. II, 6101. A spectroscopic study of an uncondensed spark between copper electrodes in three different gases at various pressures. III, 6102

Singowitz, U. *See* de Beauclair, W., 5916

Singwi, K. S. and Sundaresan, M. K. Thermal conductivity of dense matter, 6164

Sinha, M. S. A mixed shower of nuclear origin, 1156

Sinha, S. P. *See* Cowan, R. D., 2546, 6875

Sinton, W. M. *See* McCubbin, T. K., Jr, 190

Sirianni, A. F., Moses, G. B. and Puddington, I. E. Particle shape in thixotropic suspensions, 4857

Sirk, H. *See* Danninger, R., 9510

Sirkar, S. C. On the origin of low frequency Raman lines in organic crystals, 5304

Sirkar, S. C. and Kastha, G. S. Brillouin components in light scattered by quartz, 2583

Sirkar, S. C. and Ray, A. K. On the Raman spectra and heat capacity of benzene at low temperatures, 978

Sirota, N. N. Temperature dependence of the stability of a supercooled phase, 2614. On two types of S-shaped curves of the stability of a supercooled phase, 2615

Sirvetz, M. H. The microwave spectrum of sulfur dioxide, 6868. *See also* Baird, D. H., 937

Siryuk, A. G. *See* Shendrik, K. K., 3449

Sitte, K. Report on recent work on penetrating showers and penetrating particles. II, 428. Differential multiplicity in meson production, 4494. The integral multiplicity of meson production, 4495

Sittel, K. and Menzer, E. An improved fully electric radiosonde, 3967

Sivadjian, J. Reflection of light from two parallel moving mirrors, 8609

Sizoo, G. J. *See* Heerschap, M., 2966; Stoker, P. H., 7229

Sjölander, A. *See* Löwdin, P.-O., 6743

Sjöstrand, N. G. A 200 kV neutron generator, 9010

Skalnik, J. G. *See* Reich, H. J., 7890

Skanavi, G. I., Demeshina, A. I. and Chrelashvili, A. G. Temperature hysteresis of electric conductivity of hard dielectrics with relaxation polarization, 6205

Skarsgard, H. M. *See* Haslam, R. N. H., 1996, 5761

Skelton, G. F. *See* Michels, A., 3852

Skinner, G. B., Edwards, J. W. and Johnston, H. L. The vapor pressure of inorganic substances. V. Zirconium between 1949 and 2054°K, 3488

Skinner, H. A. Comments on: Factors affecting bond strengths. I. A possible new definition of electronegativity. II. Empirical relations involving force constants and ionization potentials, 7157. *See also* Pritchard, H. O., 5641

Skinner, M. *See* Richman, C., 3043

Skolbeltsyn, D. V. and Zatsepin, G. T. Structure of anomalously large atmospheric showers of cosmic radiation, 2784*

Skolnik, S. *See* McEwan, W. S., 4339

Skorobogatov, V. L. *See* Volkov, D. I., 6372

Skudrzyk, E. The construction of efficient ultrasonic radiators. I, 6809; II, 7641

Skvarla, J. E. and Evans, E. C. Cold trap anti-icing shield, 6783

Slade, J. J., Jr. *See* Reis, A. J., 5913

Slansky, S. On the formulae for normalization and mean values, for the photon and particles of spin higher than $\frac{1}{2}$, 78. On the principle of spectral decomposition in the theory of particles with spin greater than $\frac{1}{2}$, 1624

Slater, J. C. A simplification of the Hartree–Fock method, 4113. Note on orthogonal atomic orbitals, 4585. Magnetic effects and the Hartree–Fock equation, 5561. The electron theory of solids, 8872

Slätis, H., du Toit, S. J. and Siegbahn, K. The disintegration of In^{116}, 587

Slätis, H., Hjalmar, E. and Carlsson, R. *Q*-values for (α, p) reactions on aluminium and boron by means of photographic emulsions, 4695, 8958

Slavatinskiĭ, S. *See* Azimov, S., 9568; Zatsepin, G. T., 437

Slee, O. B. *See* Stanley, G. J., 797

Slepian, J. Electromagnetic ponderomotive forces within material bodies, 1192. Lines of force in electric and magnetic fields, 4361

Slevogt, H. The Seidel formulae after elimination of the object ray, 6098 *See also* Drodofsky, M., 249

Slichter, C. P. *See* Norberg, R. E. 9641

Slichter, L. B. An electromagnetic interpretation problem in geophysics, 9187

Slichter, W. P. *See* Kistiakowsky, G. B., 5804

Sliv, L. A. Theory of a double β-decay, 8171. *See also* Voikhanskiĭ, M. E., 564

Sloan, R. *See* Bak, B., 950

Slodbodskoĭ, L. I. and Kirenskiĭ, L. V., 2840

Sloth, E. N. *See* Duffield, R. B., 1278

Slotnick, M. Magnetic neutron diffraction from exchange-coupled lattices at high temperatures, 9733. *See also* Jost, R., 1295

Sluis, K. L. V. *See* Rank, D. H., 5319

Smakula, A. and Klein, M. W. Influence of optical working on surface structure of plastic crystals, 2075

Small, T. R. *See* Faro, I. D. V., 2446

Smaller, B. Precise determination of the magnetic moment of the deuteron, 8131. *See also* Yasaitas, E., 6390

Smaller, B. and Avery, E. The use of gated-beam tubes in coincidence circuits, 8803

Smaller, B., May, J. and Freedman, M. Scintillation studies on potassium iodide, 218

Smaller, B., Yasaitis, E. and Anderson, H. L. Magnetic moment of the deuteron, 4614

Smart, J. S. *See also* Greenwald, S., 492; Maxwell, L. R., 4836

Smart, J. S. and Greenwald, S. Crystal structure transitions in antiferromagnetic compounds at the Curie temperature, 5569

Smee, J. F. *See* Finlay, E. A., 381

Smerd, S. F. A radio-frequency representation of the solar atmosphere, 31. Radio-frequency radiation from the quiet sun, 806. The polarization of thermal ''solar noise'' and a determination of the sun's general magnetic field, 808

Smit, J. Magnetoresistance of ferromagnetic metals and alloys at low temperatures, 8866

Smith, A. D. N. An electronic instrument for the measurement of the damping capacity of materials, 5824

Smith, A. H., Riley, N. A. and Lawson, A. W. A radiographic method of dilatometry, 4330

Smith, A. L. *See also* Taylor, W. J., 4297

Smith, A. L., Keller, W. E. and Johnston, H. L. Infra-red spectra of condensed oxygen and nitrogen, 198. The infrared and Raman spectra of condensed nitric oxide, 4263

Smith, A. M. Forbidden beta-ray spectra, 7233

Smith, C. P. A phoneme detector, 6816

Smith, C. S. *See* Neighbours, J. R., 1363

Smith, D. C. Infrared spectrum of stibine, 4279 *See also* Daasch, L. W., 4258; Nielsen, J. R., 2544, 7712

Smith, D. F. and McNally, J. R., Jr. Isotope shifts in enhanced samarium isotopes, 3434

Smith, D. F., Tidwell, M. and Williams, D. V. P. The microwave spectrum of BrCl, 958

Smith, D. P. The widened lattice interval and its essential role in the behavior of crystalline metal, 6486

Smith E. J. Observation of precipitation with an airborne radar, 1542. Observations of rain from non-freezing clouds, 3984

Smith, E. R. *See* Bates, R. G., 3134

Smith, F. G. *See* Ryle, M., 9234

Smith, F. M. On the branching ratio of the π^+ meson, 4753. *See also* Barkas, W. H., 6473

Smith, G. A. *See* Emeleús, K. G., 6994

Smith, G. S. Some non-electrical properties of the dropping mercury electrode, 3887

Smith, H. D. *See* Dauphinee, T. M., 2598

Smith, H. F. Simplified calculation of a linear regression, 4029

Smith, H. M. The determination of time and frequency, 61, 4069

Smith, J. A. G. *See* Bacon, G. E., 2072

Smith, J. J. *See also* Rugg, F. M., 4238

Smith, J. J. and Alger, P. L. Finite representation of impulse functions, 3251

Smith, J. L. *See* Kron, G. E., 5035

Smith, J. R. *See* Murray, W. D., 3966

Smith, K. F. Spin of sodium–24, 7187

Smith, L. G. Magnetic electron multipliers for detection of positive ions, 4394. A new magnetic period mass spectrometer, 5478

Smith, L. P. Semi-conducting materials. The motion of electrons and holes in silver chloride, 7864

Smith, L. W. and Kruger, P. G. Thick target yields from the (d, n) reaction at 10 MeV, 9008

Smith, M. C., Barrett, R. E. and Beyer, R. T. Ultrasonic absorption measurements in aqueous solutions of magnesium sulfate, 4189

Smith, N. J. The case for gravity data from boreholes, 1529

Smith, P. B. and Allen, J. S. Nuclear recoils resulting from the decay of Be^7, 4644

Smith, P. D. P. Artificial field equations for a region where μ and ε vary with position, 520

Smith, P. L. Some further experiments with an oscillating disc in liquid helium, 2624

Smith, R. A. Semi-conducting materials. The electrical and optical properties of certain sulphides, selenides and tellurides, 7885

Smith, R. D. and Anderson, R. A. 32-keV excited state of aluminium–28, 9676

Smith, R. S. *See* Klein, M. J., 3622, 4528

Smith, R. V. *See* Richards, H. T., 2035
Smith, S. W. Surface tension of liquid metals, 9309
Smith, W. V. *See* Anderson, R. S., 4248; Burkhalter, J. H., 202; Crable, G. F., 4247; Hill, R. M., 5281
Smith-White, W. B. Energy in electrostatics, 1030. Thermodynamics of a fluid dielectric, 4357
Smits, F. *See* Pahl, M., 561
Smolenskiĭ, G. A., Karamyshev, M. A. and Rozgachev, K. I. Ferro-electric properties of some solid solutions, 9443
Smolenskiĭ, G. A. and Kozhevnikova, N. V. The problem of the occurrence of ferroelectricity, 5385
Smolenskiĭ, G. A. and Pasynokov, R. E. Theory of ferro-electricity, 9438
Smolitskiĭ, Kh. L. Evaluation of derivatives of fundamental functions, 2365
Smollett, M. and Blackman, M. Lattice stability and oriented overgrowth, 8340
Smoluchowski, R. Influence of order on magnetic properties, 7064. Theory of grain boundary motion, 7303. *See also* Achter, M. R., 9012; Carr, W. J., Jr, 9624; Goldman, H. E., 1936; Newkirk, J. B., 3911
Smullin, L. D. and Glass, W. G. The offset wave-guide junction as a reactive element, 9615
Smyth, C. P. Dielectric relaxation in liquids and solids, 1043
Smythe, B. M. *See* Barclay, G. A., 1036, 8883
Smythe, W. R. Electric and magnetic forces between sphere and wire, 4360. On Kerr cell construction, 7845
Snelgrove, J. A. *See* McIntosh, R., 8312
Snell, A. H. Neutron decay: the problem and the experiments, 9009
Snell, A. H., Barker, E. C. and Sternberg, R. L. Photo-disintegration cross sections of deuterium and beryllium for the gamma-rays of sodium 24 and gallium 72, 2048
Sneyers, R. Thermal correction to the cistern and fixed scales of the barometer, 6781
Snoek, J. L. Density variations in aluminium, 1375. Cation distribution in copper zinc ferrite, 1937. The natural width of a grain boundary in a metal, 3061. Magnetic properties of ferrites, 6338
Snow, A. I. The outer electron configuration in metallic copper, 9645
Snow, A. I. and Rundle, R. E. The structure of dimethylberyllium, 9178
Snow, G. *See also* Kleinman, D., 7296
Snow, G. and Snyder, H. S. On the self-energies of quantum field theory, 2370
Snyder, C. W. *See also* Brown, B. A., 4710
Snyder, C. W., Rubin, S., Fowler, W. A. and Lauritsen, C. C. A magnetic analyzer for charged-particles from nuclear reactions, 1115
Snyder, H. S. Charge renormalization in the Hartree approximation, 4098. Remarks concerning the adiabatic theorem and the *S*-matrix, 8526. *See also* Pasternack, S., 3033; Snow, G., 2370
Snyder, R. G. *See* Decius, J. C., 6872
Snyder, T. M. and Williams, R. W. Upper limit for the time between fission and the emission of neutrons, 3786
Snyder, W. F. *See* Corliss, E. L. R., 1688
Sobolev, V. V. The radiation of stellar envelopes in the absence of radiative equilibrium, 51. The problem of the diffuse reflection and transmission of light, 208
Sochnev, A. Ya. Determination of optimum parameters of magnetic systems with permanent magnets, 3623
Softky, S. D. *See* Bartell, F. O., 3015
Sokolov, A. *See* Ivanenko, D., 2909
Sokolov, A. V. *See* Vonsovskiĭ, S. V., 3629
Sokolov, L. D. Theory of the influence of the speed on the resistance of metals in plastic deformation, 2097
Sokolov, V. I. Some consequences of Bernoulli's equation, 1649
Sokolskaya, I. L. *See* Kruglova, M. D., 5508
Solaini, L. *See* Aliverti, G., 3950
Solberg, A. W., Jr. *See* Perkins, J. F., 4442
Sollfrey, W. Wave propagation on helical wires, 7122
Sollfrey, W. and Goertzel, G. Some quantum-mechanical divergences of a simple field, 8503
Solomon, A. K. *See* Glendenin, L. E., 2971; Okrent, D., 8779
Solovev, V. A. *See* Mikhailov, I. G., 9348
Someren, E. van. *See* van Someren, E.
Somers, E. V. and Cyphers, J. A. Analysis of errors in measuring thermal conductivity of insulating materials, 8676
Somersalo, A. *See* Vestin, R., 3388
Sommer, H., Thomas, H. A. and Hipple, J. A. Values of μ_π, F, and M_p/m_e using the omegatron, 2913. The measurement of e/M by cyclotron resonance, 5381
Sommereyns, G. *See* Lacourt, A., 8332
Sommerfeld, A. and Bopp, F. On the problem of Maxwell stresses, 1920. Fifty years of quantum theory, 4078
Sommerfeld, A. and Ramberg, E. The couple acting on a permanent magnet in the field of a permeable medium, 1175
Sommeria, J. The high voltage apparatus at the Ivry laboratory for atomic synthesis: accelerators, 4445. A new principle for an ion source of high intensity, 7959
Sommermeyer, K. *See* Israël, H., 8063
Sommers, H. S., Jr, Weiss, P. R. and Halpern, W. Magnet current stabilizer, 8837
Sondheimer, E. H. Influence of a transverse magnetic field on the conductivity of thin metallic films, 1853
Sonoda, M. The efficiency of the Geiger–Müller counter for the high-energy γ-rays. II, 3583; III, 3584. *See also* Arakatsu, B., 6461
Soonawala, M. F. Some nuclear levels, 1228
Sopwith, D. G. *See* Allen, D. N. de G., 3084
Sorensen, B. N., Dale, B. M. and Kurbatov, J. D. Disintegration scheme of scandium^{46}, 1269
Sörensen, S. O. C. Emission of energetic helium and lithium fragments in nuclear explosions, 2812
Sorrel, J. D. *See* Walker, W. D., 8226
Sörum, H. *See* Cole, W. F., 2183
Soutif, M. *See also* Gabillard, R., 9604; Grivet, P., 8124
Soutif, M., Dreyfus, B. and Ayant, Y. Study of lithium sulphate monohydrate by nuclear magnetic resonance, 9634
Soutif, M. and Gabillard, R. Study of a transient phenomena in nuclear resonance, 8123
Soutif-Guicherd, J. and Lambinet, M. Evidence for magnetic rotatory polarization at a frequency of 3 000 Mc/s, 3671
Sowerby, L. The unsteady flow of viscous incompressible fluid inside an infinite channel, 2417
Sozina, A. N. *See* Kosman, M. S., 6958
Spalding, D. B. A simple manometer for use in measuring low air velocities, 893. Combustion of fuel particles, 6173
Sparks, G. K. *See* Teal, G. K., 4385
Sparks, M. *See* Goucher, F. S., 4300; McAfee, K. B., 7897; Shockley, W., 6965
Späth, W. On the sensitometry of light-sensitive layers, 5962
Speakman, J. B. *See* Ripa, O., 679
Spear, W. E. Investigation of electron optical properties of an electrostatic focusing system, 4434. *See also* Ehrenberg, W., 2722, 3566
Spedding, F. H. *See* Parkinson, D. H., 6395
Speiser, A. Project for an electronic [digital] computer, 8428. *See also* Rutishauser, H., 783, 2296, 4999, 5976
Speiser, R. *See* Brice, B. A., 1777; Edwards, J. W., 4908, 8358
Spells, K. E. Velocities of steel fragments after perforation of steel plate, 3352
Spence, R. D. *See also* Granger, S., 8117; Leitner, A., 521
Spence, R. D. and Wells, C. P. Vector wave functions, 9614
Spencer, D. E. Separation of variables in electromagnetic theory, 4541. *See also* Moon, P., 172, 4222
Spencer, L. V. and Fano, U. Penetration and diffusion of X-rays. Calculation of spatial distributions by polynomial expansion, 5449, 7929
Spencer Jones, H. The system of astronomical constants, 1570. The origin of the solar system, 7458
Spenke, E. The impedance of crystal rectifiers with heavy d.c. loading in the direction of the barrier, 2691
Sperduto, A. *See also* Endt, P. M., 8193; Enge, H., 7264; Strait, E. N., 4706; Van Patter, D. M., 606, 3712, 4718

Sperduto, A., Holland, S. S., Jr, Van Patter, D. M. and Buechner, W. W. Excited state of C^{14} from the $C^{13}(d, p)C^{14*}$, 3009

Sperling, J. The temperature field of a free-burning carbon arc, 337

Spiegler, G. A new method of use of the photographic film as quality indicator and dose meter for X- and gamma-rays, 2726

Spiegler, K. S. and Coryell, C. D. Electromigration in a cation exhange resin, 7347

Spiers, F. W. Radiotherapeutic physics. II. Dosage in irradiated soft tissue and bone, 9881

Spiers, J. A. On the directional correlation of successive nuclear radiations, 1989. *See also* Blin-Stoyle, R. J., 7234

Spink, E. W. *See* Pratt, A. W., 2195, 9191

Spink, J. A. *See* Cowley, J. M., 8254, 8365

Spinrad, B. I. *See* Rose, M. E., 7249

Spitzer, L., Jr. On the interpretation of measured solar wave-lengths, 2326. *See also* Bates, D. R., 6682; Cohen, R. S., 1059; Wolfe, B., 795

Spitzer, L., Jr and Baade, W. Stellar populations and collisions of galaxies, 5043

Spivak, G. V. and Stolyarova, E. L. Plasma formation under an electric impulse, 1857

Sponer, H. and Nordheim, G. P. Discussion of the lowest singlet transition in naphthalene as a forbidden transition A_{1g}–A_{1g} and remarks on the higher singlet levels, 7717

Spoor, A. *See* de Vries, H., 2242

Spotz, E. L. *See also* Bird, R. B., 899

Spotz, E. L. and Hirschfelder, J. O. Liesegang ring formation arising from diffusion of ammonia and hydrogen chloride gases through air, 9781

Spragg, W. T. *See* Ritchie, A. B., 7434

Sproull, R. L. *See also* Bever, R. S., 7837; Tyler, W. W., 7693

Sproull, R. L., Dash, W. C., Tyler, W. W. and Moore, A. R. Growth and manipulation of barium oxide crystals, 7377

Sproull, R. L. and Tyler, W. W. Semi-conducting materials. Semi-conduction and photo-conduction in barium oxide crystals, 7884

Spurr, R. A. and Chang, S. C. Out-of-plane hydrogen vibrations in triborine triamine, 5647

Spring, K. H. *See* Cadwell, J. H., 1633

Sprott, T. J. An automatic recording polarograph, 693

Spruch, L., On the space exchange magnetic moments of light nuclei, 1979

Spurr, R. T. *See* Finch, G. I., 3847

Squire, C. F. Pressure waves in liquids, 9342. *See also* Alers, P. B., 9485

Squire, H. B. The round laminar jet, 9301

Squire, W. A speed limit for rockets? 3351

Sreb, J. H. The half-life of Na^{24}, 4636. The half-life of I^{131}, 4638

Średniawa, B. *See* Rayski, J., 7543

Sreeramamurty, K. Absorption spectrum of anisole, 3446. Electronic bands of paradibromo-benzene, 9380. Absorption spectrum of phenetole, 9381. *See also* Ramasastry, C., 945

Srikant, H. *See* Sastri, M. V. C., 3156, 3158

Srinivasan, D. *See* Parthasarathy, S., 1675

Srinivasan, T. K. *See* Raman, C. V., 1474

Srivastava, A. M. Ultrasonic studies of gels, 3151–2, 5192, 8263. Elastic constants of gelatinous substances, 4793. Determination of elastic constants of gels by ultrasonic method, 8262. Ultrasonic studies of Weimarn gels, 9080

Srivastava, B. N. and Bhatnagar, A. S. Thermal ionization of lithium and determination of specific charge of Li^+, 7983

Srivastava, B. N. and Saharia, V. N. Construction of a new combined vacuum furnace and mass spectrometer for universal use, 1111

Srivastava, K. G. A new and quick method for detection of piezo-electricity and measurement of the piezo-electric constants, 7843

Srivastava, S. B. L. Measurement of acoustic impedance, 8604

Staeble, F. Image formation for objects lying in a principal section of a system, 6097

Stafford, G. H. The total cross section of beryllium, aluminium, sulphur and lead for neutrons of energies from 2 MeV to 6 MeV, 5785. *See also* Cassels, J. M., 9537; Sharpe, J., 5809

Stagg, J. M. Solar radiation at Kew Observatory, 6640

Stahl, P. Effect of the adsorption of gases on the polymorphic transformation $\alpha \rightleftharpoons \beta$ of quartz, 6925

Stähelin, P. and Busch, G. The electrical conductivity of molybdenum trioxide, 1049

Stahl, H. A. Electron diffraction in valve technology, 2746

Stahr, M. E. Bibliography of extraterrestrial radio noise, 7456

Stair, R. Photoelectric spectroradiometry and its application to the measurement of fluorescent lamps, 7656. Ultraviolet spectral distribution of radiant energy from the sun, 9849

Staker, W. P. A determination of the high altitude latitude dependence in cosmic-ray neutron intensity, 1165

Staker, W. P., Pavalow, M. and Korff, S. A. The latitude effect of cosmic-ray neutrons, 5535

Stakgold, I. *See* Kornhauser, E., 4551

Stammreich, H., Sala, O. and Forneris, R. On an abnormality of the intensity ratio of the Stokes and anti-Stokes frequencies in the Raman spectrum of CCl_4, 1758

Standil, S. *See* Pringle, R. W., 2980

Standley, K. J. *See* Adam, G. D., 491

Stanford, G. S. *See* Duckworth, H. E., 4618, 8909

Stanley, E. Structure and epitaxy of the mixed salts $NaK_5Cl_2(S_2O_6)_2$ and $NaK_2Cl(S_2O_6)$, 9836

Stanley, G. J. and Slee, O. B. Galactic radiation at radio frequencies. II. The discrete sources, 797

Stanley, J. P. The absorption of long and very-long waves in ionospheres, 2870. Ionospheric reflection of very long radio waves, 3669. *See also* Gellman, H., 2981; Whale, H. A., 2869

Stanton, T. F. A photo-electric comparator for colorimetric determinations, 9405

Stanworth, J. E. A nickel-chromium-iron alloy for sealing to glass, 772

Stark, K. H. Equivalence of temperature and frequency in dielectric measurements, 290. *See also* Daniel, V., 4365

Stark, R. H. *See* Allen, W. A., 8614

Starr, V. P. Geostrophic departures in the jet stream, 2208

Starr, V. P. and White, R. M. A hemispherical study of the atmospheric angular-momentum balance, 9208

Startsev, V. I. *See* Gindin, I. A., 7373

Startseva, I. E. *See* Shur, Ya. S., 2876

Statton, W. O. The phase diagram of the BaO–TiO_2 system, 4813

Statz, H. On the theory of surface states, 4569

Stauder, W. V. and Weber, A. H. Electron diffraction studies of etched Au leaf films, 5822

Stauss, H. E. *See* Berg, O. E., 4393; Von Batchelder, F. W., 7440

Staveley, L. A. K. *See also* Thomas, D. G., 7811

Staveley, L. A. K. and Tupman, W. I. Entropies of vaporization, and internal order in liquids, 2650

Staverman, A. J. The theory of measurement of osmotic pressure, 5158

Steacie, E. W. R. *See* Bywater, S., 4848, 4851–2; Calvert, J. G., 4849; Ivin, K. J., 8301; Masson, C. R., 4850; Miller, D. M., 4830; Trotman-Dickenson, A. F., 4845–7

Stearns, B. F. *See* Sard, R. D., 8012

Stearns, M. *See* Silverman, A., 8979

Stearns, M. B. *See also* McDaniel, B. D., 3020

Stearns, M. B. and McDaniel, B. D. Angular distribution of the two gamma-rays from $Li^7(p, \gamma)Be^8$ reaction, 6454

Stebbins, J. The electrical photometry of stars and nebulae, 5981

Stebler, A. *See also* Bichsel, H., 4733

Stebler, A., Bichsel, H. and Huber, P. The $B^{10}(n, \alpha)Li^7$ reaction with fast neutrons and the energy of the reaction $D(d, n)He^3$, 619

Steel, W. H. A four-figure method of ray tracing, 3424. The accuracy of polarization photometers, 4221. The design of reflecting microscope objectives, 5343

Steele, M. C. Thermoelectromotive force of a superconductor *versus* the same metal in the non-superconductive state, 3533. Experiments relating to the penetration depth in superconductors, 7903. *See also* Webber, R. T., 1066

Steele, M. C. and de Launay, J. Empirical correlation for a thermoelectric property of superconductors, 5423

Steele, W. C. *See* Decius, J. C., 6872

Steenland, M. J., de Klerk, D., Potters, M. L. and Gorter, C. J. The magnetic behaviour of iron ammonium alum at very low temperatures, 5581

Steenland, M. J., de Klerk, D., Seun, J. A. and Gorter, C. J. The magnetic behaviour of copper potassium tutton salt at very low temperatures; a correction and an addition, 5586

Steeple, H. *See also* Lipson, H., 6573

Steeple, H. and Lipson, H. Formation of order in the alloy $CdMg_3$, 3068

Stefanizzi, A. On the radioactivity of atmospheric precipitates, 2216

Steffen, R. M. Angular correlation of the gamma-rays emitted from the excited states of A^{38}, 2016. Dual decay of the 50-day In^{114} isomer and angular momenta of the excited states of Cd^{114}, 7221. The dual decay of Re^{186}, 7212. *See also* Hart, R. J., 5488

Stehberger, K. H. An "electrical nose" for the continuous observation of atmospheric aerosols, 4916

Stehle, P. Dynamics of star streaming. II, 40

Steidletz, M. E. *See* Shiflett, C. J., 1260

Steigert, F. E., Toops, E. C. and Sampson, M. B. Alpha-particle range-energy curve for Kodak NTA emulsion, 8789

Steigerwald, K. H. A positive emission from heated cathodes, 3601

Stein, A. *See* Finkelnburg, W., 1505

Stein, B. R. *See* Schweitzer, G. K., 2013

Stein, G. Consonant electron systems, 3692. *See also* Day, M. J., 7200

Stein, M. *See* Moore, H. S., 3234

Stein, N. *See* Boyd, C. A., 5165

Steinberg, J. C. *See* Potter, R. K., 1701

Steinberg, J.-L. *See* Blum, E.-J., 3281, 4047; Denisse, J. F., 7465

Steinberg, R. K. Hot-cathode arcs in cesium vapor, 345

Steinberger, J. *See* Bishop, A. S., 2060; Chedester, C., 7288; Durbin, R., 8223; Sachs, A., 7290; Jakobson, M., 4752

Steiner, J. Measurement of the density and direction of current lines in galvanic electrolytes, 4840

Steiner, R. F. *See* Doty, P., 709

Steingrimsson, V. *See* Boyd, C. A., 5165

Steinhaus, D. W. *See* Crosswhite, H. M., 5241

Steinwedel, H. On the radiation reaction in classical meson-theory, 3334. The classical meson dynamics as an action at a distance theory, 3335. On the formalism of linear field theories, 6021. On radiation reaction in the Wheeler–Feynman reformulation of electron theory, 7529. *See also* Danos, M., 7177

Steinwedel, H. and Danos, M. Proton density variation in nuclei, 1236

Steinwedel, H. and Jensen, J. H. D. The hydrodynamics of nuclear dipole oscillations, 1231

Steinwedel, H., Jensen, J. H. D. and Jensen, P. Nuclear dipole vibrations, 1235

Stejskal, F. Measurement of displacement and force with inductive pick-ups, 6766

Stekolnikov, I. S. Investigation of the initial stage of the discharge for very small inter-electrode distances, 2712

Stelmak, J. P. Electric forming in *n*-germanium transistors using phosphorus-alloy contacts, 6966

Stelson, P. H. and Goodman, C. The inelastic scattering of 15 Mev neutrons by lead, iron and aluminium, 4741

Stelson, P. H. and Preston, W. M. The $Mn^{55}(p, n)Fe^{55}$ neutron spectrum, 5753. Fast neutron energies determined by the use of resonant scatterers, 8233

Stelson, P. H., Preston, W. M. and Goodman, C. The $V^{51}(p, n)Cr^{51}$ neutron spectrum, 2033

Stenström, L. A. Three-dimensional potential gradient tank, 3396

Stent, G. S. *See* Wall, F. T., 1462

Stepanov, A. V. Reasons for the characteristics of breakdown of elastoanisotropic bodies, 2102

Stepanov, B. I. *See also* Sevchenko, A. N., 6889

Stepanov, B. I. and Girin, O. P. Determination of the duration of the excited oscillatory state by means of M. I. Veĭngerov's spectrophone, 7146

Stepanov, P. E. Relaxation absorption of elastic vibrations in β-brass near the Curie point, 2466

Stephens, R. E. *See* Tilton, L. W., 175

Stephens, W. E. *See also* Byerly, P. R., Jr, 4721, 7270; Sher, R., 3771; Toms, M. E., 5777

Stephens, W. E., Halpern, J. and Sher, R. Photoproduction of N^{17}, 5774

Stephenson, G. Mass of fundamental particles, 850. Calculation of the oscillator strengths for certain band systems of N_2 and C_2, 2893. Experimental determination of the life-times of atomic resonance states, 2929*. Life-time of the lithium atomic resonance states, 2930. Calculation of relative transition probabilities for first negative bands of N_2^+, 5261. On the experimental determination of the lifetimes of atomic energy states, 6394. Calculation of oscillator strengths for certain electronic transitions in B_2 and Na_2, 7165. Calculation of the oscillator strength for the $^2\Pi - {}^2\Delta$ transition in the CH molecule, 9630

Stephenson, N. C. and Mellor, D. P. The crystal structure of indium monobromide, 5920

Stephenson, S. T. and Martin, D. L. Note on crystals suitable for double crystal X-ray spectroscopy in the region 3 to 15A, 4904

Stericker, W. and Hazel, F. The adhesion of phosphors on cathode-ray screens, 1753

Stern, A. On the theory of a.c. circuits for arc lamps, 4402

Stern, J. *See* Baxendale, J. H., 1388; Gee, G., 3822

Stern, K. H., Healey, F., Jr and Martell, A. E. Contact distances of ion pairs in the isomeric dichloroethanes, 9441

Stern, M. O. and Bloom, A. L. Elastic *d–p* scattering at 190 MeV, 7025

Sternberg, E., Eubanks, R. A. and Sadowsky, M. A. On the stress-function approaches of Boussinesq and Timpe to the axisymmetric problem of elasticity theory, 9744

Sternberg, R. L. *See* Snell, A. H., 2048

Sternglass, E. J. Secondary electron emission and atomic shell structure, 3707

Sternheimer, R. On nuclear quadrupole moments, 1974

Stetter, W. and Bothe, W. The energy levels of the highly excited N^{15} nucleus, 6386

Stevels, J. M. The relation between the dielectric losses and the composition of glass, 1044. Dielectric losses and breakdown of ceramic materials. III. Dielectric losses in glass, 6952

Stevens, G. W. W. Temperature coefficients of swelling and development in thick emulsions for nuclear research, 775. Radioactive microphotographs for resolution testing in autoradiography, 2287

Stevens, K. N. Autocorrelation analysis of speech sounds, 2484

Stevens, K. W. H. Resonance in antiferromagnetics, 5566. *See also* Elliott, R. J., 4534

Stevens, V. I. Hypersonic research facilities at the Ames Aeronatuical Laboratory 134

Stevens, W. H. *See* Yaffe, L., 625, 8202

Stevenson, D. G. A combined mechanical stage and focusing control for photo-micrographic work, 8669

Stevenson, D. P. Ionization and dissociation by electron impact: cyanogen, hydrogen cyanide, and cyanogen chloride and the dissociation energy of cyanogen, 1135. On the mass spectra of propanes and butanes containing C^{13}, 4484

Stevenson, D. P., Tunnicliff, D. D. and Wagner, C. D. On the ultraviolet absorption of cyanogen chloride, 4285

Stevenson, D. P. and Wagner, C. D. The mass spectra of C_1–C_4 monodeutero paraffins, 4483

Stevenson, D. T. and Deutsch, M. Electron-gamma-angular correlation measurements in radioactive decay, 8937

Stevenson, M. L. *See* Crawford, F. S., Jr, 6452

Steward, E. C. The monohydrate of ethylenediamine *d* tartrate: optical properties and X-ray diffraction data, 3946. *See also* Rooksby, H. P., 4490

Steward, G. C. On the cardinal points in plane kinematics, 8537

Steward, S. P. Measurement of tensile strength of suture materials, 5835

Stewardson, E. A. and Lee, P. A. The M_{IV} and M_V absorption edges of ^{68}Er, 3552

Stewart, D. B. *See* Bartell, F. O., 3015
Stewart, H. S. *See* Curcio, J. A., 5356
Stewart, K. H. Domain wall movement in a single crystal, 5589. Experiments on a specimen with large domains, 6324
Stewart, M. T., Thomas, R., Wauchope, K., Winegard, W. C. and Chalmers, B. New segregation phenomena in metals, 8240
Stewart, R. W. Triple velocity correlations in isotropic turbulence, 1657
Stewart, R. W. and Townsend, A. A. Similarity and self-preservation in isotropic turbulence, 5145
Stewartson, K. On the interaction between shock waves and boundary layers, 7617. On the impulsive motion of a flat plate in a viscous fluid, 9306
Stiefel, E. *See* Rutishauser, H., 783, 2296, 4999, 5976
Stiehl, G. L. *See* Delahay, P., 9108
Stiles, W. S. *See* Cabello, J., 2250
Stille, U. Rational and non-rational treatment of the electromagnetic field, 513. Equations with 3, 4 and 5 fundamental quantities in electrodynamics, 514. Velocity of light, 8608. The rationalization problem in electrodynamics, 9608
Stiller, B. *See* Shapiro, M. M., 8014
Stinchcomb, T. G. The barometric effect for large cosmic-ray bursts under thick absorbers at 11 500 feet elevation and the absorption mean free path for very high energy nuclear collisions, 1911. Experiments on large cosmic-ray bursts under thick absorbers at 11 500 feet elevation, 7052
Stitt, F. and Tomimatsu, Y. Sensitized paper for estimation of mercury vapor, 9798
Stix, T. *See* Winckler, J. R., 451
Stocker, P. M. On a problem of interaction of plane waves of finite amplitude involving retardation of shock-formation by an explosive wave, 9345
Stockinger, F. *See* Ehrenhaft, F., 8082
Stöckmann, F. Addition to my report "On electrical conduction in semi-conductors," 2685
Stockmayer, W. H. *See* Jacobson, H., 3176–7
Stoddard, A. E. *See* Cork, J. M., 573, 577, 2017, 4647, 4677, 5708, 8926, 8943, 9672
Stoenner, R. and Elliott, N. The magnetic susceptibility of uranium tetrachloride, 7100
Stoker, P. H., Ong Ping Hok and Sizoo, G. J. The radiations of UY(^{231}Th), 7229
Stolov, H. L. The semidiurnal tidal oscillation of the earth's atmosphere, 9851
Stolyarova, E. L. *See* Spivak, G. V., 1857
Stoll, P. *See* Nabholz, H., 7259
Stollenwerk, E. Wegener, P., 7616
Stone, C. A. *See* Reiffel, L., 6299; Rest, F. G., 5515
Stone, F. S. *See also* Garner, W. E., 1413
Stone, F. S. and Tiley, P. F. Reactions on the surface of copper oxide. II. Surface processes and heats of adsorption, 1413
Stoneley, R. Polarization of the *S*-phase of seismograms, 6603
Stoner, E. C. Ferromagnetism: magnetization curves, 506. Collective electron ferromagnetism in metals and alloys, 7063
Stoppini, G. *See* Mezzetti, L., 4504; Quaranta, A. A., 9545
Stora, C. On the theoretical effect of the geometry of the experimental arrangement on the formation of Debye–Scherrer lines using a divergent beam, 3201. On the theoretical effect of absorption in the specimen and of experimental conditions on the homogeneity of Debye–Scherrer lines, using a divergent beam, 4906
Storch, H. H. *See* Anderson, R. B., 4819
Storer, J. E. The impedance of an antenna over a large circular screen, 8058
Storm, M. L. Heat conduction in simple metals, 6919
Størmer, C. Results of numerical calculations of the trajectories of electric corpuscles in the field of an elementary magnet. VII. Trajectories through the origin; supplementary beams, 3557
Storruste, A. The Rayleigh scattering of 0·41 MeV gamma-rays at various angles, 1294
Stout, J. W. *See also* Griffel, M., 1501, 2836
Stout, J. W. and Griffel, M. The magnetic anisotropy of $\alpha - NiSO_4 : 6H_2O$ between 13 and 295°K. A torsion balance for magnetic anisotropy measurements, 2835
Stout, T. M. A note on control area, 17
Stovall, E. J., Jr. *See* Brolley, J. E., Jr, 5758
Stover, B. J. Os^{182} and Os^{183}, new radioactive osmium isotopes, 1275. New neutron-deficient radioactive isotopes of the light rare-earth region, 2948
Stoyko, A. On the variation of the velocity of propagation of radio waves, 8065
Stoyko, A. and Stoyko, N. On the diurnal variation of the signal propagation and of the frequency between America and Europe, 7410
Stoyko, N. The seasonal fluctuations in the rotation of the earth, 8483. On the variations of the magnetic field and the rotation of the earth, 9184. *See also* Stoyko, A., 7410
Strachan, C. *See* Malcolm, I., 9283
Strain, H. H. Chromatographic systems, 3897
Strait, E. N. *See also* Van Patter, D. M., 606, 3712
Strait, E. N., Van Patter, D. M., Buechner, W. W. and Sperduto, A. The reaction energies of light nuclei from magnetic analysis, 4706
Straiton, A. W. *See also* LaGrone, A. H., 5611; Tolbert, C. W., 4557
Straiton, A. W., Metcalf, D. F. and Tolbert, C. W. A study of tropospheric scattering of radio waves, 8857
Straker, T. W. *See* Bracewell, R. N., 4559
Strandberg, M. T. *See* Weiss, M. T., 4267
Strandberg, M. W. P. *See also* Hillger, R. E., 8101; Lawrance, R. B., 7154; Loomis, C. C., 4269; Weiss, M. T., 7746
Strang, L. G., Jr. *See* Winsche, W. E., 7282
Stranks, D. R. and Harris, G. M. Carbon-14 isotope effect in an inorganic equilibrium, 4812
Stranski, I. N. On the energy thresholds in crystal growth, 740
Stranski, I. N. and Wolff, D. Vapour pressure and rate of evaporation, 3489
Stranz, D. The lowest of the ionized layers of the upper atmosphere, 2206
Strashkevich, A. M. The potential field of duants ["dees"]. I, 7943. *See also* Gavrilyuk, V. M., 7944; Rabin, B. M., 7006, 9518
Strassl, H. Nomograms for the solution of the Kepler equation $[M = E - e \sin E]$, 5975
Stratton, T. F. *See* Freier, G. D., 605
Stratton, W. R. *See* Claassen, R. S., 5481
Strauch, K. High-energy photo-nuclear reactions, 5765
Straumanis, M. E. and Fang, O. C. The structure of metal deposits obtained by electrochemical displacement upon zinc, 3078
Straus, H. A. *See* Bell, P. R., 630
Straus, O. H. The relation of phonetics and linguistics to communication theory, 1693
Strauser, W. A. *See* Shull, C. G., 5568, 7072
Strauss, R. A new "quotient meter" for the electron microscope, 2740
Strawbridge, J. G. *See* Oldroyd, J. G., 3359
Street, J. C. *See* Nonnemaker, G. M., 7053
Street, K., Jr. *See also* Ghiorso, A., 3762; Reynolds, F. L., 2933; Thompson, S. G., 2950, 3721
Street, K., Jr, Ghiorso, A. and Seaborg, G. T. The isotopes of americium, 565
Street, R. Antiferromagnetism, 5552
Streicher, M. A. *See* Roald, B., 703
Strelkov, P. G. Thermometrical research in the region of low temperatures, 1808
Strick, E. *See* Bradford, R., 8109
Strickland-Constable, R. F. Two-phase equilibrium in binary and ternary systems. VII. Calculation of latent heats and some other similar properties, 9757
Strijland, J. C. *See* Michels, A., 2643
Stripp, K. F. and Kirkwood, J. G. Asymptotic expansion of the partition function of the asymmetric top, 8878
Strong, H. M. *See* Bundy, F. P., 7814
Strong, J. New Johns Hopkins ruling engine, 4135. *See also* Benesch, W., 4235; Taylor, J. H., 8616
Strong, J. and Plass, G. N. The effect of pressure broadening of spectral lines on atmospheric temperature, 2210
Strong, P. *See* Rose, M. E., 7249
Strother, F. P. and Granberry, H. Glass-to-metal seal for vacuum systems, 6785

Strough, R. I. and Shrader, E. F. Pulsed air core series disk generator for production of high magnetic fields, 8849

Stroupe, J. D. *See* Cooper, C. V., 6898

Struthers, J. D. *See* Moore, G. E., 2608

Struve, O. Curves of growth, 6003. Notes on stellar spectra, 8480

Stuart, D. A. *See* Hodgdon, F. B., 683–4

Stuart, G. W., Jr and Rosen, P. A cylindrical cavity filled with a d.c. discharge, 3653

Stuart, J. T. *See* Meksyn, D., 8546

Stuart, R. N. *See* Watson, K. M., 5739

Studer, F. J. *See also* Johnson, P. D., 6854

Studer, F. J., Cusano, D. A. and Young, A. H. Transparent luminescent films, 7765

Studier, M. H. *See* Huizenga, J. R., 6462

Stueckelberg, E. C. G. Relativistic quantum theory for finite time intervals, 2364. *See also* Petermann, A., 6024

Stueckelberg, E. C. G. and Green, T. A. Elimination of arbitrary constants in the relativistic theory of quanta, 6728

Stull, D. R. Machine computation of relation between resistance and temperature of a resistance thermometer, 270

Stumpers, F. L. H. M. On a first-passage-time problem, 788

Sturcken, E. F. *See* Heller, R. B., 2748, 8932

Sturdivant, J. H. *See* Vaughan, P. A., 2907

Sturgess, J. W. Observations of the latitude effect of penetrating showers, 8007

Sturm, W. J. and Johnson, V. A comparison of several nuclear absolute voltage determinations, 8186

Sturrock, P. New formulae for the third order aberrations of [axially symmetric] magnetic lenses, 9520. New formulae for the third order aberrations of [axially symmetric] electrostatic lenses, 9521

Sturrock, P. A. Note on the focusing of electron beams in certain magnetic fields, 1097. The aberrations of magnetic electron lenses due to asymmetries, 7008

Sturtevant, J. M. A millisecond timer, 7580. *See also* Bogan, S., 5895; Buzzell, A., 7824

Style, D. W. G. *See* Dyne, P. J., 6884

Styvendael, M. van. *See* van Styvendael, M.

Subrahmaniam, K. E. *See* Kanekar, C. R., 8309

Subrahmanyam, D. S. A note on the critical area of surface films and evaporation through them, 114

Succi, C. *See* Lovati, A., 5441

Sucksmith, W. Magnetic saturation intensity and some other related measurements, 7103. *See also* Myers, H. P., 7107

Suddaby, A. *See* Levine, S., 3861, 5863

Sudo, T. and Hayase, K. Photoelectric spot analysis of antimony and bismuth, 5899

Süe, M. Analysis by the use of artificial radioelements and of neutrons, 8325

Süe, P. *See also* Chemla, M., 9681; Major, J. K., 3758; Pauli, J., 3387

Süe, P. and Bélilovsky, P. The spatial location, from a distance, of an object marked by a γ-ray emitter (cobalt 60), 3715

Suemoto, Z. Ionization equilibrium in the solar chromophere, 8456. Observation of the limb effect of faint Fraunhofer lines, 9242. Line contours in the anomalous regions of the sun, 9244

Sueoka, A. On the Stark effect of helium in strong electric field. I, 1722

Suess, H. E. Magic numbers and the missing elements technetium and promethium, 6387. *See also* Haxel, O., 538

Suffcyzyński, M. The dependence of the efficiency of Geiger–Müller counters for gamma rays upon the wall thickness, 7960

Suga, K. *See* Watase, Y., 8825

Sugarman, N. Photo-fission of bismuth, 616

Sugarman, N. and Peters, R. Photo-activation of bismuth, 5764

Sugawara, M. Remarks on Bethe's neutral theory of nuclear force, 6036. *See also* Ôno, Y., 5072, 8500

Sugawara, M. and Ono, Y. On the equivalence of pseudoscalar and pseudovector coupling constants in pseudoscalar meson theory, 3333

Sugawara, T. *See also* Kanda, E., 5923

Sugawara, T. and Kanda, E. On the transition of yellow phosphorus at low temperatures. II, 4338

Sugimoto, K. *See* Wakatsuki, T., 8204

Suhl, H. *See* Pearson, G. L., 7910

Suhner, F. *See* de Malleman, R., 3688, 5618–19, 8072–4

Suhrmann, R. Influence of crystal structure on the adsorption of foreign molecules, 1450

Suita, T. Dielectric breakdown in ionic crystals, 8757. Dielectric breakdown in mixed crystals of KCl and AgCl, 8758. *See also* Kondo, S., 194, 2671; Okazaki, C., 8728; Yamanaka, C., 8759

Sullivan, J. H. and Davidson, N. The kinetics of the forward and reverse reactions for the vapor phase thermal bromination of chloroform, 4832

Sun, K.-H. *See also* Allen, A. J., 4698; Jennings, B., 2038

Sun, K.-H., Harris, D., Pecjak, F. A., Jennings, B., Allen, A. J. and Nechaj, J. F. Angular distribution of fast neutrons from deuteron bombardment (of Be), 5755

Sun, K. H., Jennings, B., Shoupp, W. E. and Allen, A. J. Excitation function of $C^{14}(\alpha, p)N^{17}$, 5741

Sun, K.-H., Pecjak, F. A., Charpie, R. A. and Nechaj, J. F. Excitation function of $Ta^{181}(d, p)Ta^{182}$, 6457*

Sundara Rao, R. V. G. Elastic constants of the heptahydrates of magnesium and zinc sulphates, 671. Elastic constants of orthorhombic sulphur, 3090

Sundarachar, C. K. Excitation of nitrogen in a sodium arc, 6106

Sundaram, P. N. The electrical constants of soil at ultra-high frequencies, 6950

Sundaram, P. N., Suri, S. K., Sagar, A. and Gupta, U. C. Simple and efficient pentode scalers, 1888

Sundaresan, M. K. *See* Singwi, K. S., 6164

Sunyar, A. W. Measurement of some internal conversion coefficients, 8952. *See also* Friedlander, G., 1274; Goldhaber, M., 8894, 8920

Sur, P. K. The absorption spectrum of bismuth sulphide BiS, 7719. A new band system of bismuth chloride in absorption, 7742

Suran, J. J. Effect of weak betas on the breakdown of dielectric gaps, 7916

Surdin, M. A ten-channel time discriminator, 3354. Progress in France in electronic instrumentation for nuclear physics, 3595. A note on resistance fluctuations and flicker effect, 9461. *See also* Picard, E., 4511

Suri, S. K. *See* Sundaram, P. N., 1888

Suriani, L. R. *See* Voet, A., 1817, 8721

Suryan, G. A new method of integration of weak nuclear magnetic resonance signals, 1237. Nuclear resonance in flowing liquids, 5557

Suryanarayana Rao, K. Multiplet separations in the f^4-electron configuration, 553

Sushkin, N. G. *See* Biberman, L. M., 371

Sutherland, G. B. B. M. Some problems in the interpretation of the infra-red spectra of large molecules, 7708. *See also* Simpson, O., 6974

Sutherland, G. B. B. M. and Jones, A. V. The application of polarized infra-red radiation to problems in molecular structure. I. Polyisoprenes, 7727

Sutra, G. Hydrogen overvoltage, electrical double layer and related problems, 9065

Sutton, G. J. *See* Beard, D. S., 8349

Sutton, L. E. *See* Allen, P. W., 5463, 9023; Cottrell, T. L., 6379; Hill, R. A. W., 3115; Mackle, H., 9096; Orgel, L. E., 4583

Sutton, O. G. On the stability of a fluid heated from below, 1642. Atmospheric turbulence (disc.), 4929

Sutton, R. B. *See* Foss, M., 8049; Pearlstein, E. A., 389

Suvorov, L. D. *See* Eĭdus, L. Kh., 2786

Suwa, S. *See* Murakawa, K., 1971, 2511

Suzor, F. *See also* Charpak, G., 2979, 3734–5, 7940

Suzor, F. and Charpak, G. Differences in the scattering of electrons and β-rays, 4443

Suzuki, H. *See* Takeuchi, S., 4795–7

Suzuki, K. Markoff chains and chain molecules, 5891. *See* Shirane, G., 3211, 3929

Suzuki, T. *See also* Kakiuchi, Y., 2642

Suzuki, T. and Yamamoto, M. Anelasticity of ferromagnetics: magnetoelastic relaxation in nickel, 4794

Svensson, H. An interferometric method for recording the refractive index derivative in concentration gradients. I, 6831; II. Arrangement for and the theory of the purely optical differentiation of the refractive index function, 6833. An optical arrangement for getting simultaneous records of the refractive index and its derivative for stratified solutions, 6832. On the use of Rayleigh–Philpot–Cook interference fringes for the measurement of diffusion coefficients, 9397

Sverdlov, L. M. Relation between the frequencies of isotopic molecules (sum rule), 8628

Sverdlov, Z. M. A new method of investigating the absorption and luminescence of micro-objects at low temperatures, 193

Sveshnikov, A. G. Emission principle, 2390

Svirina, E. P. *See* Akulov, N. S., 6354

Svyatoezerskaya, L. A. *See* Mendelev, B. G., 6289

Swainger, K. H. A linear theory of finite strain, 1360. Finite elastic straining, 2092

Swallow, J. C. *See* Gaskell, T. F., 6606

Swan, J. B. Evidence of multiple meson production, 8013

Swan, P. Interactions between neutron and proton, 5099

Swan, W. O. *See* Simmons, J. W., 1964

Swann, C. P. *See also* Hudspeth, E. L., 2041; Mandeville, C. E., 614

Swann, C. P., Mandeville, C. E. and Whitehead, W. D. The neutrons from the disintegration of the separated isotopes of magnesium by deuterons, 612

Swann, W. F. G. On certain matters pertaining to electrets, 1045

Swanson, G. W., Jr and Thomson, W. T. The design of resonant quartz-crystal ultrasonic transducers for research purposes, 2472

Swanson, H. E. Tables for conversion of X-ray diffraction angles to interplanar spacing, 6578

Swanson, H. E. and Tatge, E. Standard X-ray diffraction patterns, 5918

Sweeney, D. W. *See* Goldstein, L., 1331

Sweet, P. A. The importance of rotation in stellar evolution, 9246

Sweeton, F. H. *See* Jenks, G. H., 2946

Swengal, R. C. *See* Hess, W. B., 1645

Swenson, C. A. The liquid-solid transformation in helium near absolute zero, 266

Swensson, J. W. Predictions of atomic lines in the infrared, 7472

Swiatecki, W. J. The density distribution inside nuclei and nuclear shell structure, 1239. Theoretical studies in nuclear structure. III. Radial integrals for the nuclear *s*, *p* and *d* shells, 2920. The nuclear surface energy, 3701. Nuclear compressibility and fission, 7283

Swift, M. W. *See* Rosser, W. G. V., 8016

Swinbank, W. C. A sensitive vapour pressure recorder, 3969

Swindell, G. E. *See* Griffith, H. D., 7436

Swings, P. Spectroscopic problems of astronomical interest, 5044

Swinnerton, A. C. *See* Corwin, J. F., 9809

Sworski, T. J. and Burton, M. A study of effect of impingement-particle velocity in radiolysis of some aromatic hydrocarbons, 9777

Sylwestrowicz, W. and Hall, E. O. The deformation and ageing of mild steel, 6510

Symonds, J. L. *See* Butler, S. T., 8971

Synge, J. L. Pointwise bounds for the solutions of certain boundary-value problems, 7446

Syozi, I. The statistics of honeycomb and triangular lattice. II, 95

Szasz, G. J. Rotational isomerism in perfluoro paraffins, 2148

Szebehely, V. G. Relation between gas evolution and physical properties of liquids, 5162. *See also* Etkin, B., 2412; Schweitzer, P. H., 870

Szigeti, B. Compressibility and absorption frequency of ionic crystals, 2104. A review and discussion of dielectric constants of ionic crystals, 2666

Sziklai, G. C. A tristimulus photometer, 5229

Szwarc, M. Factors influencing bond dissociation energies, 3170. A reply to the letter to the editor entitled, "Concerning the steric factor of free radical reactions" by Gomer and Dorfman, 4817. Remarks on the calculating rates of some radical reactions, 4818. Experimental methods for measurement of bond dissociation energies and heats of formation of radicals, 6548. *See also* Leigh, C. H., 9794; Murawski, J., 6527; Sehon, A. H., 9795

Szwarc, M., Ghosh, B. N. and Sehon, A. H. The C–Br bond dissociation energy in benzyl bromide and allyl bromide, 535

Szwarc, M., Leigh, C. H. and Sehon, A. H. The influence of aromatic substitution on the C–Br bond dissociation energy, 5888

Szwarc, M. and Murawski, J. The kinetics of the thermal decomposition of acetic anhydride, 9051

Szwarc, M. and Sehon, A. H. The C–Br bond dissociation energy in trichlorobromomethane, 2902. The effect of halogenation on the C–Br bond dissociation energy in halogenated bromomethanes, 5887

Tabern, D. L. *See* Gleason, G. I., 7198

Tabor, D. *See* Menter, J. W., 3071; Rabinowicz, E., 9036

Tachimori, S. *See* Kumagai, H., 7097

Tadayon, J. A simple pressure recorder, 7582

Taft, E. *See also* Apker, L., 318, 4391, 6973

Taft, E. and Apker, L. External photoelectrons from F' centres in RbI, 7900

Taft, E. A. *See* Dickey, J. E., 1845

Tagg, J. R. *See* Rosenbrock, H. H., 760, 9196

Taglang, P. Saturation moments and Curie temperatures of isoelectronic face-centred cubic alloys of the iron group, 7075. *See also* Meyer, A.-J.-P., 1177, 1923, 6343, 8030

Tagliaferri, G. *See* Lovati, A., 2806, 5541, 9557

Tai, C. T. The effect of a grounded slab on the radiation from a line source, 4556. *See also* El-Bedewi, F., 9696; Middleton, R., 9698

Taieb, J. Mass spectrograph for the rapid analysis of gas mixtures, 2154

Taimuty, S. I. The beta-spectrum of Tc^{99}, 4660. *See also* Van Atta, C. M., 3562

Taira, S. *See* Nishihara, T., 4803

Tait, G. W. C. Flowmeter error in measuring pulsating flow, 137

Tait, J. F., Cook, J. R. and Worsnop, R. Physical measurements in routine clinical diagnosis with I^{-131}, 2265

Tajima, S. and Mori, T. Anodic polishing of nickel in electrolytes containing chlorine ions, 9061

Takagi, E. *See* Watanabe, Y., 4492

Takagi, R. An electron microscope and diffraction study of metallic smoke, 9021

Takagi, Y. *See also* Shirane, G., 8716

Takagi, Y. and Oguchi, T. Relaxation of the long range order in brass problem, 6493

Takagi, Y., Oguchi, T. and Shirane, G. Relaxation of the long range and short range orders in β brass, 6494

Takakubo, K. Continuous light of the solar corona, 8457

Takakura, T. *See* Oda, M., 8451

Takamura, J. *See* Nishimura, H., 9029

Takase, B. On the probability distribution of the field strength of fluctuating forces in stellar systems, 8463

Takayama, K. *See* Kojima, S., 1864, 3545

Takayanagi, K. *See also* Aidzu, K., 5120; Fujimoto, Y., 636, 5118

Takayanagi, K. and Yamaguchi, Y. Notes on fluctuation in nuclear evaporation process, 5690

Takeda, A. *See* Shirane, G., 2178, 6202

Takeda, G. *See also* Aidzu, K., 5120; Fukuda, H., 5116, 5121

Takesada, Y. On the magnetostriction vibrator as a source of supersonics, 912

Taketani, M. *See also* Nakumura, S., 5115

Taketani, M., Nakamura, S. and Sasaki, M. On the method of the theory of elementary particles, 5106

Taketani, M., Nakamura, S., Umezawa, M., Ono, K. and Yamaguchi, Y. *ft*-values of β-decay and the shell models, 6389

Takeuchi, H. On the earth tide of the compressible earth of variable density and elasticity, 3228

Takeuchi, S. and Suzuki, H. "Temperature interval" of lattice transformation. I, 4795. Theory of plasticity. I. Correlation between lattice transformation and plastic gliding in metals, 4796; II. Critical shear stress of binary alloys, 4797

Takeyama, H., Kitahara, T. and Matubayasi, T. On the mathematical treatment of the effect of the width of the slit on Fraunhofer's diffraction phenomenon, 6147

Takeyama, H. and Nisimoto, K. Note on a phenomenon concerning the terminal voltage of a cadmium lamp, 6243

Takeyama, H., Nisimoto, K. and Matubayasi, T. On the light intensities of small-type spectral lamps. I, 6242; II. On the influence of external circuits and weak magnetic field, 9506

Takibaev, Zh. S. Calculation of highest approximations of the scattering of fast electrons by electrons, 8773. Transition effects for heavily ionizing particles and stars recorded by nuclear emulsions in the stratosphere, 9576

Talbot, F. L., Busala, A. and Weiffenbach, G. C. Angular distribution of $Li^7(p, \alpha)\alpha$, 4707

Talbot, S. A., Lilienthal, J. L., Jr, Beser, J. and Reynolds, L. W. A wide range mechano-electronic transducer for physiological applications, 4200

Talley, R. M. and Nielsen, A. H. The infra-red spectrum of C_2H_2 from 4 400 to 8 500 cm^{-1}, 2543. Vibration-rotation transitions of C_2D_2 in the microwave region, 7745

Tallmadge, F. K. *See* Allred, J. C., 4988

Talmi, I. On the spin of the nuclear ground state in the *jj*-coupling scheme, 5665

Talyanskiĭ, I. I. *See* Glauberman, A. E., 8729

Tamarkin, P., Boyer, G. L. and Beyer, R. T. Experimental determination of acoustic wave fronts, 4194

Tamburino, S. *See* Addario, M. M., 2804, 3621; Milone, C., 420

Tamor, S. The absorption of slow π-mesons in deuterium, 4693. *See also* Marshak, R. E., 3041

Tamor, S. and Marshak, R. E. On the absorption of π^--mesons in deuterium, 3042

Tanabe, S. *See* Nonaka, I., 3181

Tanabe, Y. The change of the electric resistance of bismuth crystals in strong magnetic fields. I. The method and apparatus for observing the change of resistance of bismuth in strong magnetic fields, 4562; II. Experimental results. The change of resistance of bismuth crystals in a magnetic field with the current perpendicular to the field, 4563; III. Experimental results, 5620; IV. The discussion and interpretation of the experimental results, 8076

Tanaka, S. On the acoustic folded horns, 4197

Tanaka, T., Katsumori, H. and Toshima, S. On the theory of cooperative phenomena, 7144

Tanaka, Y., Seya, M. and Mori, K. New absorption bands of the NO molecule in the extreme ultraviolet region, 6877

Tang, M. Y. *See* Peng, H. W., 4593

Tang, T.-Y. *See* Lawson, A. W., 2167

Tangen, R. Experimental investigations of proton capture processes in light elements, 9688

Tani, S. *See* Arizumi, T., 2681

Tanifuji, M. *See* Muto, T., 7255

Taniuti, T. On the Cerenkov radiation, 7934

Tanikawa, Y. A new interpretation of the negative energy Bose field, 5071

Tanner, K. N. and Duncan, A. B. F. Raman effect and ultraviolet absorption spectra of molybdenum and tungsten hexafluorides, 5287

Tanni, L. and Niskanen, E. The geoidal undulations and disturbing masses, 5058

Tanor, D. *See* Sanders, J. V., 3072

Tanuma, S. *See* Fukuroi, T., 3526, 4565–6; Tobisawa, S., 6218

Taplin, G. V. and Douglas, C. H. A colorimetric dosimeter for qualitative measurement of penetrating radiations, 6538

Taplin, R. H. *See* Moody, N. F., 7973, 9553–4

Tappere, E. J. An adjustable lens holder, 6907

Tarasova, T. M. Influence of temperature and viscosity on absorption and emission of acridine derivatives, 6887

Tardi, P. and Laclavère, G. Treatise on geodesy. (Second Edition). Vol. 1. Triangulation. No. 1. Mathematical basis of geodesy. Terrestrial operations, 7498

Tartakovskiĭ, B. D. Sound transmission layers, 2465. Experimental investigation of the diffraction in the focus of acoustic lenses, 8600

Tarte, P. *See* D'Or, L., 8638–9

Tarutina, L. I. *See* Mikhaĭlov, I. G., 2469

Taschek, R. F. *See* Jarvis, G. A., 608

Tate, A. E. L. *See* Allen, N. P., 9746

Tatel, H. E. Argon^{40} and the age of the earth, 1532

Tatevskiĭ, V. M. *See* Akishin, P. A., 6120

Tatge, E. *See* Swanson, H. E., 5918

Tatsumoto, E. Magnetization of single crystal plates of silicon steel in weak fields, 1186

Taub, A. H. and Wax, N. Theory of the parallel plane diode, 399; Erratum, 2774

Taube, H. *See* Hunt, J. P., 5849

Taubman, A. B. On molecular exchange effects in adsorption layers, 3150

Tauzin, P. Theory of positive and negative photophoresis, 4218. *See also* Bouchard, J., 920; Cotton, E., 3675

Tauzin, P. and Creusot, J. Theory of magnetophotophoresis, of helical motion, and of electrophotophoresis, 524

Tavora, E. A new chart for setting the Buerger precession camera, 9822

Tawde, N. R. *See also* McKellar, A., 6111

Tawde, N. R. and Mehta, G. K. A note on the critical pressure effect in collisions of the second kind in molecular spectra, 2551

Taylor, A. Lattice parameters of binary nickel-cobalt alloys, 749. The development of the high-powered moving-anode X-ray tube, 2722. An improved direct-reading X-ray microdensitometer, 7386

Taylor, A. E. *See also* Cassels, J. M., 5743

Taylor, A. E., Pickavance, T. G., Cassels, J. M. and Randle, T. C. Total cross-sections of hydrogen and carbon for high energy neutrons, 3038. The hydrogen and carbon total cross-sections for energies between 39 MeV and 156 MeV, 5786. Total cross-sections of the elements for 156 MeV neutrons, 8207

Taylor, B. T. *See* Egelstaff, P. A., 2052, 6466, 7280

Taylor, C. *See* Larsson, K.-E., 7030

Taylor, C. A. *See also* Hanson, A. W., 9142; Lipson, H., 9141

Taylor, C. A., Hinde, R. M. and Lipson, H. Optical methods in X-ray analysis. I. The study of imperfect structures, 6579

Taylor, C. A. and Lipson, H. Optical methods in crystal-structure determination, 7385

Taylor, C. J. *See also* Jentschke, W. K., 6894

Taylor, C. J., Remley, M. E., Jentschke, W. K. and Kruger, P. G. Response of some scintillation crystals to heavy particles, 6893

Taylor, D. Instrumentation and the atomic energy programmes, 3592. *See also* Sharpe, J., 1124, 4465

Taylor, D. and Abson, W. Radiation measuring instruments for X-rays to cosmic rays, 5684

Taylor, D. and Sharpe, J. Nuclear particle and radiation detectors. I. Ion chambers and ion-chamber instruments, 1123, 4464

Taylor, G. A discussion on detonation: similarity solutions to problems involving gas flow and shock waves, 3119

Taylor, G. R. *See* Parr, R. G., 4588

Taylor, H. A. *See* Johnson, C. I., 5870

Taylor, H. J. *See* Lal, D., 638

Taylor, H. S. Catalysis: retrospect and prospect, 2123

Taylor, J. A discussion on detonation: High and low detonation velocity regimes in condensed explosives, 3124

Taylor, J. D. *See* Gleason, G. I., 7198

Taylor, J. H. Pressure dependence of resistance of germanium, 2688

Taylor, J. H., Rupert, C. S. and Strong, J. An incandescent tungsten source for infrared spectroscopy, 8616

Taylor, J. K. *See* Greenough, M. L., 8295

Taylor, L. S. The measurement of X and gamma radiation over a wide energy range, 3555. *See also* Fano, U., 2725

Taylor, N. W. *See* Dahlquist, C. A., 9026

Taylor, R. Complete molecular orbital treatment of the system H_4, 3683

Taylor, T. T. and Whinnery, J. R. Applications of potential theory to the design of linear arrays, 2859

Taylor, W. H. *See* Cole, W. F., 2183

Taylor, W. J. General form of the force constant matrix for harmonic vibrations, 1219. Diffuse X-ray scattering by disordered binary alloys, 5819. *See also* Holden, R. B., 1730; Koch, G. P., 4233

Taylor, W. J., Smith, A. L. and Johnston, H. L. A low temperature Raman cryostat, 4297

Tazaki, H. and Kuwabara, S. A study of sulphide films on copper by electron diffraction, 6495. A study of oxide films formed on copper-magnesium alloys by electron diffraction, 9742

Tazaki, H. and Miyano, K. X-ray examination of clay minerals, 1352

Tazulaknov, B. D. Secondary emission cathodes, 2752*

Tchen, C.-M. Stochastic processes and dispersion of configurations of linked events, 7571

Tcheng Kien. Intensity of the 4 300 Å band of the CH molecule in stellar spectra of types F, G, K, and M, 3295. Researches on the CH bands in stellar and solar spectra, 6701

Tcheng, M.-L. Spectrophotometric study of the polarization of the light from the blue sky in the zenith from 3 050 Å to 4 500 Å, 8383. *See also* Dufay, J., 9858

Teal, G. K. *See also* Goucher, F. S., 4380; Shockley, W., 6965

Teal, G. K., Sparks, M. and Buehler, E. Growth of germanium single crystals containing *p–n* junctions, 4385

Teasdale-Buckell, P. *See* Barrell, H., 6143

Tebble, R. S. and Corner, W. D. Investigations on the reversible susceptibility of ferromagnetics, 1938

Tebble, R. S., Corner, W. D. and Wood, J. E. Reversible effects in the magnetization of nickel, 9595

Teegan, J. P. *See also* Hammond, V. J., 7756; Price, W. C., 5289

Teegan, J. P. and Walsh, A. D. The absorption spectrum of 1 : 1-dichloroethylene in the vacuum ultra-violet, 3447. Empirical relations involving ionization potentials, 8905

Tegart, W. J. McG. *See* Moore, A. J. W., 9039

Teichmann, T. Beam oscillations in an F–M cyclotron, 1117. On the interpretation of resonance levels and their widths in terms of the scattering length and the effective range, 7252

Teichner, S. *See* Bernard, R., 7311

Teillac, J. *See* Albouy, G., 3742; Falk-Vairant, P., 8951

Teissier du Cros, F. On the decomposition of any state of equilibrium into two simple states derivable from holomorphic functions, 9024. On certain invariant contour integrals in photoelasticity, 9401

Telegdi, V. L. and Zünti, W. Investigation of the photodisintegration of C^{12} into 3 alpha-particles, 3768

Telesnin, R. V. Some rules for magnetic viscosity, 3643

Telesnin, R. V. and Kuritsyna, E. F. Dependence of magnetic viscosity on temperature, 3644

Telesnin, R. V. and Ushakov, S. Z. Magnetic viscosity of Permalloy in aperiodically varying and in sinusoidal fields, 8041

Tellegen, B. D. H. The forces between two conductors, 1194

Teller, E. *See* de Hoffmann, F., 1945; McMillan, W. G., 4862, 6539

Tellez-Plasencia, H. Calculation of the error in ionization measurements made with a chamber having no guard-rings, 5493

Telton, J. On the ionic conductivity and lattice defects of silver bromide with monovalent impurities, 9464. On the ionic and electronic conductivity and lattice defects of silver bromide with impurities of silver, cadmium and lead sulphide, 9465

Temmer, G. M. High-energy protons emitted from carbon at 90° to a 240-MeV proton beam, 9690

Temperley, H. N. V. The theory of changes of state, 2607. On the velocity of second sound in liquid helium II, 2632. The theory of the propagation in liquid helium II of "temperatures-waves" of finite amplitude, 2633

Temple, G. The "tip effect" in oscillating supersonic flow, 3400

Temple, R. B. *See* Ambrose, E. J., 5909; Hill, R. A. W., 3115

Templeton, D. H. *See* Karraker, D. G., 2942, 4648, 7224

Templeton, I. M. *See* MacDonald, D. K. C., 5418

ten Bruggencate, P. Remarks on the connection between the Rosseland and Chandrasekhar values for the opacity in stellar atmospheres, 53

ten Bruggencate, P., Gollnow, H. and Jäger, F. W. On an attempt to discover a real intensity distribution at the extreme edge of the sun's disk, 30

Tendolkar, G. S. *See* Andrew, J. H., 1337

Tendron, G. *See* Chanu, J., 7688

Tennevin, J. *See* Guinier, A., 7439

ten Seldam, C. A. *See* Lunbeck, R. J., 9338; Michels, A., 9447

Terentiuk, F. *See* Blüh, O., 3136

Teresi, J. D. *See* Nye, W. N., 5491

ter Haar, D. A phenomenological theory of visco-elastic behaviour. I, 3094; II, 3095; III, 4800

Terletskiĭ, Ya. P. Discussion on the extent of the many particle problem on molecular physics, 8870. *See also* Kolpakov, P. E., 3283

Ter-Martirosyan, K. Comments on nuclear decay in an electromagnetic field, 8912. Excitation of nuclei under the influence of fast electrons, 8956. *See also* Karamyan, A. S., 6319

Ter-Pogossian, M. *See also* Ittner, W. B., III, 8800

Ter-Pogossian, M., Cook, C. S., Porter, F. T., Morganstern, K. H. and Hudis, J. Disintegration of Ti^{45}, 1997; Addendum, 4643

Ter-Pogossian, M. and Ittner, W. B., III. A scintillation counter for the relative determination of X-ray intensities in radiological work, 8799

Ter-Pogossian, M. and Porter, F. T. Radioactive strontium produced by deuteron bombardment of rubidium, 5697

Ter-Pogossian, M., Porter, F. T. and Cook, C. S. On the transport of aluminium atoms by gas, 1662. Auxiliary equipment to be used with a beta-ray spectrometer for the study of radioactive gases, 7232

Terra, L. *See* Lovati, A., 9557

Terrell, J. Gamma-rays from $Be^9(\alpha, n)$, 2993

Terrell, J. and Phillips, G. C. Gamma-rays from deuteron bombardment of B^{10}, B^{11}, N^{14}, and F^{19}, 8196

Terrien, J. and Desvignes, F. A photometric separator for precision visual spectrophotometry, 2493

Terris, A. *See* Rado, G. T., 7108

Terwilliger, K. M., Jones, L. W. and Jarmie, W. N. Relative photoneutron yields from the 330-MeV bremsstrahlung, 7267

Tessier, M. and Blottiau, F. The variations of the photometric properties of the eye at photopic luminance levels, 9870

Tessman, J. R. The Lorentz correction in hexagonal barium titanate, 7841

Tetlow, K. S., McAuslan, J., Brimley, K. J. and Price, W. C. A double-beam recording infra-red spectrometer, 6103

Teucher, M. *See* Houtermans, F. G., 5805*

Thain, W. *See* Philpotts, A. R., 2528

Thaler, R. M. A calculation of the electron affinity of sodium, 7193

Thaler, W. J. *See* Fitzpatrick, J. A., 1859

Theimer, O. Quantum-mechanical interpretation of Kohlrausch's "natural system of screening constants and effective quantum numbers," 558

Thellier, E. Magnetic properties of baked clays and rocks, 6330

Thellier, E. and Thellier, O. Researches on the intensity of the geomagnetic field in the past, 6613

Thellier, O. *See* Thellier, E., 6613

Thellung, A. *See* Kronig, R., 1807

Thénard, J. *See* Valladas, G., 1134

Theorell, H. and Ehrenberg, A. A micromethod for the determination of paramagnetic susceptibility of substances in dilute solutions, 8842

Theron, J. J. *See* Haul, R., 7823

Theuerer, H. C. and Scaff, J. H. Effect of heat treatment on the electrical properties of germanium, 3523

Thew, K. *See* Way, K., 2938, 6402

Thewlis, J. Structures of uranium, 9143

Thibaud, J. Abnormal radiation accompanying β-disintegrations, 2969. New high-$H\rho$, electron-producing particles in the spectra of β-active radioelements, 4658. Techniques of detecting high momentum negative particles accompanying the β-spectrum, 4659

Thibaud, J. and Lafoucrière, J. Use of trajectories asymptotic to stationary orbits for separation of high momentum particles, 8783

Thibaud, J., Maitrot, M. and Berthier, J. Properties of thin films and radiometric interprétation of longitudinal photophoresis, 921

Thibaud, J. and Perrier, D. Luminosity at the encounter of shock waves produced by hollowed charges, 9347

Thickens, R. W. Capacitance-change viscometer, 5143

Thiels, A. F. A direct-reading equivalent densitometer, 4983

Thiem, J. R. *See* Kraus, G., 104

Thiers, R. E. A step-sector for the astigmatic spectrograph, 2504. The step-sector in spectrochemical analysis, 4886

Thiessen, G. Brightness fluctuations of the granulation of the sun, 810

Thiessen, G. J. Resonance characteristics of a finite catenoidal horn, 154. *See also* Schneider, W. G., 902

Thilo, E., Jander, J., Seemann, H. and Sauer, R. The colour of rubies, 1475

Thirion, J. Angular correlation between neutron and γ ray in the disintegrations $Li^7(d, n)Be^{8*}(\gamma)Be^8$ and $Li^6(d, n)Be^{7*}(\gamma)Be^7$, 8192. Angular correlations between proton and γ ray and the spins of the first excited levels of Li^7, B^{11} and O^{17}, 8899

Thirion, J. and Muller, T. Neutron-gamma-ray angular correlation in the disintegration of Li^7 by deuterons, 5754

Thirring, W. Symmetrical quantization, 68. Quantization of higher order equations, 71. Radiative corrections in the non-relativistic limit, 842. On a fourth-order meson-equation, 851. On the coupling schemes for mesons, 5798. Report on the new discoveries in the hydrogen spectrum, 7676

Thirring, W. and Touschek, B. A covariant formulation of the Bloch–Nordsieck method, 3330

Thirsk, H. R. A note on the orientated overgrowths of metal films on single crystal inorganic substrates, 1350. *See also* Lal, H., 3865

Thode, H. G. *See* Macnamara, J., 2049, 3027; Tudge, A. P., 1026

Thomas, A. An isothermal calorimeter for measuring low rates of heat evolution over long periods, 8703

Thomas, A. B. Certain physical constants and their relation to the Doppler shift in radio echoes from the moon, 801. *See also* Mills, B. Y., 8445

Thomas, A. G. *See* Rivlin, R. S., 5826

Thomas, A. L., Jr. The graph-scope, and electronic graph plotter and graphical computer, 3261

Thomas, A. M. "Heat developed" and "powder" Lichtenberg figures and the ionization of dielectric surfaces produced by electrical impulses, 6998

Thomas, B. W. Determination of heavy water by mass spectrometer, 3184

Thomas, C. A. *See* Ayres, E., 2057

Thomas, D. A., Haynes, S. K., Broyles, C. D. and Thomas, H. C., The *L* to *K* capture ratio and disintegration energy of Sn^{113}, 7216

Thomas, D. E. *See* Davies, R. M., 3126

Thomas, D. G. *See also* Zimmerman, E. L., 2982

Thomas, D. G. and Staveley, L. A. K. The effect of particle size and deuterium substitution on the λ-point in ammonium chloride, 7811

Thomas, G. E. *See* Harris, S. P., 2073

Thomas, H. Anomalous electrical resistance changes in certain alloys, 4374

Thomas, H. A. The diamagnetic correction for protons in water and mineral oil, 3702. *See also* Sommer, H., 2913, 5381

Thomas, H. C. *See* Knox, K., 4824; Thomas, D. A., 7216

Thomas, J. G. *See* Mendoza, E., 3531

Thomas, J. T., Alpert, N. L. and Torrey, H. C. Nuclear magnetic resonance in methane, 2899

Thomas, L. A. *See also* Brown, C. S., 7375

Thomas, L. A. and Wooster, W. A. Piezocrescence—the growth of Dauphiné twinning in quartz under stress, 8335

Thomas, L. B. and Brown, R. E. The accommodation coefficients of gases on platinum as a function of pressure, 898

Thomas, O. Studies of the carboxyl group. II. The potential function of the formate ion and the formic acid molecule, 8317. *See also* Davies, M., 8316

Thomas, P. T. *See* Maccoll, A., 7357

Thomas, R. *See* Stewart, M. T., 8240

Thomas, R. G. On the determination of reduced widths from the one-level dispersion formula, 3698

Thomas, R. N. The thermodynamic structure of the outer solar atmosphere. II. Comment on empirical determinations of b_n and T_e, 56. Superthermic phenomena in stellar atmopheres. VI. Comment on regions of emission fluctuation in the solar atmosphere, 57. The ballistic contribution to meteorics, 5985. *See also* Cook, M. A., 6883

Thomas, W. J. O. The parallel vibrations of linear triatomic molecules, 8880

Thomasson, D. W. Electronic colorimetry, 4316

Thomer, G. *See* Schall, R., 5183

Thompson, A. C. *See* Heller, W., 9097

Thompson, C. N. *See* Martin, R. G., 7611

Thompson, D. O. *See* Artman, R. A., 3817

Thompson, H. W. *See also* Boyd, D. R. J., 7166, 7704; Callomon, H. J., 7751, 7753; Cave, W. T., 7755

Thompson, H. W., Nicholson, D. L. and Short, L. N. The infra-red spectra of complex molecules, 7706

Thompson, H. W. and Williams, R. L. Vibration-rotation bands of nitrous oxide, 7750

Thompson, N. *See* Davis, M., 1376; Phillips, D. J., 1377

Thompson, R. W., Cohn, H. O. and Flum, R. S. Cloud chamber observations of the neutral *V*-particle disintegration, 7992

Thompson, S. G. *See also* Ghiorso, A., 3762; Hoff, R. W., 9657; Rasmussen, J. O., 2008

Thompson, S. G., Ghiorso, A. and Seaborg, G. T. The new element berkelium (atomic number 97), 2949

Thompson, S. G., Street, K., Jr, Ghiorso, A. and Reynolds, F. L. The new isotope Pu^{242} and additional information on other plutonium isotopes, 3721

Thompson, S. G., Street, K., Jr, Ghiorso, A. and Seaborg, G. T. The new element californium (atomic number 98), 2950

Thompson, W. B. *See* Brunton, D. C., 1312

Thomsen, S. M. Low-reflection films produced on glass in a liquid fluosilicic acid bath, 7778

Thomson, D. M. *See* French, A. P., 3765

Thomson, G. and Hodgson, P. E. The cascade production of cosmic ray stars and the relative number of charged and uncharged particles, 9580

Thomson, W. T. Matrix solution for the vibration of non-uniform beams, 141. The equivalent circuit for the transmission of plane elastic waves through a plate at oblique incidence, 901. *See also* Swanson, G. W., Jr, 2472

Thon, D. M. *See* Ney, E. P., 6302–3

Thonemann, P. C. *See also* Makinson, R. E. B., 7912

Thonemann, P. C. and Cowhig, W. T. High-current gas discharge at low pressures, 1860. The role of the self-magnetic field in high current gas discharges, 5429

Thorell, B. Self-recording microspectrography and its applications on problems regarding the endocellular formation of haemoglobin, 7664

Thorell, B. and Ruch, F. Molecular orientation and light absorption, 6131

Thorington, L. Temperature dependence of the emission of an improved manganese-activated magnesium germanate phosphor, 965

Thorndike, E. M. A wide-angle, underwater camera lens, 3247

Thorness, R. R. *See* Nier, A. O., 9257

Thornhill, C. K. *See* Jones, D. M., 9346

Thornton, V. *See* Condon, F. E., 7710; McMurry, H. L., 2539, 7711

Thorp, J. S. A high-intensity X-ray generator, 2722. An X-ray microbeam spectrometer and technique of its use, 8348. *See also* Gay, P., 6252

Thouvenin, J. *See* Maze, R., 3046

Thring, M. W. Some aspects of fluid flow.—Conference at Leamington Spa, 1950 (conf. rep.), 2410. The temperature distribution along a radiating gas stream in which heat is being liberated by a chemical reaction, 7815

Throssell, W. R. *See* Bowden, F. P., 6542, 7355

Thulin, S. On the decay of I^{131}, 8934. *See also* Bergström, I., 580–1; Hedgran, A., 6434

Thurn, H. *See* Bothe, W., 432

Thurston, E. F. *See* Brooks, R., 1488

Tichenor, R. L. Role of oxide composition in oxidation of nickel and cobalt, 7339

Ticho, H. K. *See* Conversi, M., 479

Tickner, A. W. and Lossing, F. P. The measurement of low vapor pressures by means of a mass spectrometer, 9421

Tidwell, M. *See* Smith, D. F., 958

Tiedema, T. J. X-ray investigation of the nuclear spot of crystals obtained by recrystallization, 2166

Tielsch, H. Effect of weather upon cosmic radiation according to measurements during 1932/34 at Königsberg [Pr.], 8823

Tienstra, J. M. The normal section of the ellipsoid, 5055

Tiers, G. Van D. Re-examination of the infrared spectra of the monodeuterotoluenes: a method of analysis, 9118

Tikhonova, E. I. *See* Borovitskiĭ, S. I., 2709

Tikhonova, N. *See* Kurnosova, L., 438

Tikhov, G. A. Photographic determination of high brightness ratios, 1712

Tiley, P. F. *See* Stone, F. S., 1413

Tilton, L. W. and Plyler, E. K. Refractivity of lithium fluoride with application to the calibration of infrared spectrometers, 9362

Tilton, L. W., Plyler, E. K. and Stephens, R. E. Refractive index of silver chloride for visible and infra-red radiant energy, 175

Tilvis, E. The gas thermometer of the Institute of Meteorology, University of Helsinki, 7820

Timbrell, V. Absolute measurement of sound pressures at high frequency, 4212

Timofeev, D. P. *See* Dubinin, M. M., 4863

Timofeeva, V. A. Distribution of brightness in strongly dispersing media, 6150. The question of the distribution of brightness in the sea, 6151

Ting Yu. *See* Yu Ting

Tingle, E. D. *See* Bielak, E. B., 3849

Tinker, J. F. Concerning cyclic polyenes, 8095

Tinkham, M. and Kip, A. F. Paramagnetic resonance absorption crystals containing color centers, 8039

Tinlot, J. *See* Bernardini, G., 3048; Gregory, B. P., 4514–15; Lederman, L., 3790

Tiomno, J. *See* Schützer, W., 6749

Tiruvenganna Rao, P. Absorption spectra of thallium halides, 3443

Tisza, L. Theory of superconductivity, 1847. The theory of critical points, 2585

Titchmarsh, E. C. Eigenfunction problems with periodic potentials, 93. Some theorems on perturbation theory. III, 6673

Titterton, E. W. The reaction ^{7}Li(γp)^{6}He, 1308. Hammer tracks in neutron and proton induced stars, 3006. Stars produced in nuclear emulsions by 150 MeV neutrons, 3036. Emission of long-range particles in the fast neutron ternary fission of U–238 and Th–232, 8985. Probable emission of a beryllium–8 nucleus in the fast neutron fission of thorium–232, 9711. *See also* Brinkworth, M. J., 9702; Calcraft, M. E., 8974

Titterton, E. W. and Brinkley, T. A. The reaction ^{6}Li(γn)^{5}Li and energy levels of the ^{5}Li nucleus, 5760

Tittle, C. W. The thermal neutron diffusion length of paraffin, 3052. Depression of the thermal neutron density of a detecting foil, 3053. Slow-neutron detection by foils. I, 8231; II, 9729. *See also* Faul, H., 6617; Wood, C. E., 3145

Tittle, C. W. and Faul, H. The thermal neutron absorption cross section of silicon, 3031

Tittman, J. and Sheer, C. The energy dependence of the resonant scattering of slow neutrons from gold, 8237

Tittman, J., Sheer, C., Rainwater, J. and Havens, W. W., Jr. The slow neutron resonant scattering of gold, 3777

Tkaczyk, S. *See* King, D. T., 4021

Tobey, A. R. and Montgomery, C. G. Neutron production by cosmic rays at sea level, 4512

Tobias, C. W. Space charge in electrolytes during electrolysis, 9769

Tobin, M. W., Grundfest, H. and Schoenfeld, R. L. An instantaneous peak voltmeter, 4362

Tobisawa, S. *See* Fukuroi, T., 3526, 4565–6, 6218

Tochilin, E., Davis, R. H. and Clifford, J. A calibrated roentgen-ray film badge dosimeter, 361

Todd, G. *See* Picket, E. E., 6555

Todd, J. Table of arctangents of rational numbers, 9227

Toeller, H. New German technical heat-measuring instruments and controllers, 4346

Toit, S. du. *See* du Toit, S.

Tokita, N. *See* Kawai, H., 2091

Tokuoka, Z. and Katayama, Y. Some remarks on the non-local field theory, 7511

Tolansky, S. Multiple-beam interferometry, 991. Some applications of interferometry to the examination of an electrodeposited film, 6146. Applications of multiple-beam interferometry, 6895. The measurement of thin film thickness by interferometry, 6897

Tolansky, S. and Bardsley, W. Interferometric studies on the vibration of piezoelectric plates, 3407

Tolbert, C. W. *See also* Straiton, A. W., 8857

Tolbert, C. W. and Straiton, A. W. A phase-shift refractometer, 4557

Tolhoek, H. A. *See also* de Groot, S. R., 8294

Tolhoek, H. A. and de Groot, S. R. On the theory of beta-radioactivity. II. A theoretical discussion of the polarization of electron beams and its observation, 4668; III. The influence of electric and magnetic fields on polarized electron beams, 4669; IV. The polarization of beta-rays emitted by aligned nuclei in allowed transitions, 5720. The angular correlation theorem and the elimination of interference terms, 6739; Erratum, 8504

Tolpadi, S. K. R. *See* Khastgir, S. R., 8735

Tolpygo, K. B. Thermionic emission from thin semiconducting films, 5510*. *See also* Krivoglaz, M. A., 8737

Tolstoĭ, N. A. Discontinuities in the conductivity of BaTiO$_3$, 3517. *See also* Gurevich, D. B., 6225, 6885

Toman, K. The structure of NiSi, 9148

Tomasini, G. *See* Bonetti, A., 9723

Tomboulian, D. H. and Pell, E. M. Absorption by aluminum in the soft X-rays region, 8761

Tombs, N. C. *See also* Rooksby, H. P., 4529

Tombs, N. C. and Rooksby, H. P. Structure transition and antiferromagnetism in magnetite, 9596

Tomiie, Y. *See* Nitta, I., 9154

Tomimatsu, Y. *See* Stitt, F., 9798

Tomkins, F. S. *See also* Dieke, G. H., 6844; Fred, M., 5251

Tomkins, F. S. and Fred, M. A photoelectric setting device for a spectrum plate comparator, 8622

Tomonaga, S. Remarks on Bloch's method of sound waves applied to many-fermion problems, 3324

Tomotika, S. and Hasimoto, Z. On the transonic flow of a compressible fluid through an axially symmetrical nozzle, 869

Tompa, H. On the precipitation threshold of solutions of heterogeneous polymers, 3175

Tomkins, F. C. *See also* Bielanski, A., 3871

Tompkins, F. C. and Young, D. M. The adsorption of gases on caesium iodide, 3872. The adsorption of gas mixtures, 3873

Tompkins, P. C. *See* Bizzell, O. M., 7225

Tompkins, P. C., Bizzell, O. M. and Watson, C. D. Practical aspects of surface decontamination, 2149*

Toms, B. A. *See* Oldroyd, J. G., 3359

Toms, M. E. and Stephens, W. E. Photoprotons from magnesium, 5777

Tomura, M. On the electric formation of the selenium rectifier, 1830. On the characteristics of the selenium rectifier at low temperatures and the electric formation, 1831

Tomura, T. *See* Shinoda, G., 7963

Tongiorgi, V. Cocconi. *See* Cocconi Tongiorgi, V.

Tonks, L. *See* Bethe, H. A., 1327

Tonnelat, J. and Batsch, H. The influence of adsorption on the intensity of light scattered by liquids, 1778

Tonnelat, M.-A. Unitary affine theory. I. Choice of basic tensors and derivation of the fundamental equation, 826; II. Rigorous solution of the fundamental equation, 827; III. Field equations, 828. Unitary affine theory of the physical field, 5065. A study of the system formed by combination of two Dirac particles, 7537. The compatibility of the equations of unitary field theory, 8494

Toops, E. C. *See* Steigert, F. E., 8789

Tootill, G. C. *See* Williams, F. C., 2301

Toporets, A. S. Focal monochromator for the ultra-violet part of the spectrum, 1729

Toppel, B. J. *See* Bennett, W. E., 4696

Toraldo Di Francia, G. Parageometrical optics, 918. The axial aberrations of zone plates, 5320. The past and future of resolving power, 6824. *See also* Ronchi, L., 9869

Tordai, L. Errors in diffusion measurements, by the Loschmidt method, 2434

Torizuka, Y. *See* Okamura, T., 3628, 4326, 5564, 7082, 8026–7, 8841

Torkington, P. Harmonic oscillator contributions to the thermodynamic functions, 1221. The planar vibrations of ethylene and tetra-deutero-ethylene: a critical analysis of the potential function, 2892. The vibrational assignment and thermodynamic functions of tetrachloroethylene, 2897. The non-planar vibrations of some substituted ethylenes and related compounds, 3691. The inclusion of van der Waals' forces in molecular potential functions, 4582. The general valence orbitals derivable by sp_3 hybridization, 5650. A property of the mass-ratio $m_{cl}{}^{35}/m_0{}^{16}$, 5676. The nature of the scale factor occurring in the quantum-mechanical treatment of systems by the variational method, 7509

Torley, R. E. *See* Colthup, N. B., 7595

Torney, F. L. *See* Schorr, M. G., 1750

Torondzhadze, A. F. Characteristics of the movements of stars of the spectral classes O and B and extension of the stellar associations, 2341

Torrey, H. C. *See* Thomas, J. T., 2899

Torroja, J. M., Pajares, E. and Amorós, J. L. A single crystal X-ray camera for direct recording of the reciprocal lattice, 3200

Toshima, S. *See* Tanaka, T., 7144

Touger, M. L. *See* Martin, D. W., 1704

Tourneux, C. and Devin, C. Adsorptive properties of ammonium phosphomolybdate, 8314. New observations on the adsorptive properties of ammonium phosphomolybdate, 8315

Touschek, B. Quadrupole moments and the nuclear shell model, 3705. *See also* Gunn, J. C., 4748, 5126; Thirring, W., 3330

Tousey, R. *See also* Koomen, M., 4969

Tousey, R., Watanabe, K. and Purcell, J. D. Measurements of solar extreme ultraviolet and X-rays from rockets by means of a $CaSO_4$: Mn phosphor, 9209

Towler, J. H. *See also* Guy, W., 5247, 9365

Towler, J. H. and Guy, W. H. Temperature coefficients for use with rocksalt prism spectrometers, 5244

Townes, C. H. Determination of nuclear properties by microwave spectroscopy, 8120. *See* Geschwind, S., 4609; Gunther-Mohr, G. R., 4610; Low, W., 1970; Mays, J. M., 5661; Miller, S. L., 5282; Schawlow, A. L., 5667

Townsend, A. A. The fully developed turbulent wake of a circular cylinder, 136. The structure of the turbulent boundary layer, 5147. On the fine-scale structure of turbulence, 8547. The passage of turbulence through wire gauzes, 9300. *See also* Stewart, R. W., 5145

Toye, T. C. *See* Hopkins, M. R., 109

Tralli, N. and Goertzel, G. The theory of internal conversion, 7250

Trambarulo, R. *See also* Anderson, W. E., 4271

Trambarulo, R. and Gordy, W. The microwave spectrum and structure of methyl acetylene, 2527

Trapeznikova, Z. A. On the interaction of the activators in phosphors, 2554

Trapnell, B. M. W. Adsorption on evaporated tungsten films. II. The chemisorption of hydrogen and the catalytic parahydrogen conversion, 3877. *See also* Rideal, E. K., 1411, 3876

Trappeniers, N. Polyatomic molecules and the law of corresponding states, 8709

Treacy, P. B. *See* French, A. P., 6456

Trébuchon, C. and Kieffer, J. The physical aspect of glass-metal seals in the electron tube industry. II, 1552; III, 3101

Trees, R. E. Spin-spin interaction, 5673. Configuration interaction in Mn II, 8142

Treffenberg, L. *See* Beskow, G., 5011

Trefftz, E. Wave functions and transition probabilities for the Mg I atom. III. The influence of polarization, 2928

Treloar, L. R. G. The swelling of cross-linked amorphous polymers under strain, 715. Physics of rubber-like materials, 6549. *See also* Gee, G., 3822

Trementozzi, Q. A. Comparison of molecular weights of polystyrene by the light-scattering and osmometric methods, 1776

Trendelenburg, F. Acoustics of the organ, 5206

Trent, P. T. *See* George, E. P., 8000

Treuting, R. G. An achromatic doublet of silicon and germanium, 6827

Treuting, R. G. and Read, W. T., Jr. A mechanical determination of biaxial residual stress in sheet materials, 3085

Trew, V. C. *See* French, C. M., 8847

Trey, F. Unipolarity and applied voltage, 307

Trigg, G. *See also* Feenberg, E., 2977

Trigg, G. V. and Feenberg, E. A symmetry principle in the Fermi theory of beta-decay, 7235

Trillat, J.-J., Barbezat, S. and Delelande, A. The quantitative determination of the crystallinity of polyethylene as a function of temperature, 2186. Variation of the crystallinity of polyethylenes as a function of the temperature, 4911

Trillat, J.-J. and Besse, M. The study of the surface state of tissues by means of replicas, 4323

Trillat, J.-J. and Oketani, S. Apparatus for the study of insulating surfaces by electron diffraction, 3080. Electron diffraction study of cementite formation in iron. II. Effect of the gas mixture CO + H_2, 5823

Trillat, J.-J. and Pierrée, C. Control by electron diffraction of the purity of liquid hydrocarbons, 4787

Trischka, J. W. *See* Luce, R. G., 8642

Troesch, A. and Verde, M. Neutron-deuteron scattering at very low energies, 4101

Trofimov, A. K. *See* Kalinichenko, I. I., 8647; Sevchenko, A. N., 6881

Trofimov, A. V. Statistics of the life times of atomic nuclei and the stability of natural elements, 2937

Trofimova, V. A. Investigation of porportional counters, 6274

Trombe, F. Antiferromagnetism of nickel and cobalt oxides, 6332. Ferromagnetism of metallic dysprosium, 6336

Tronnier, H. and Wagener, H. The use of "coated" microscope optics, 6915

Trost, A. A new counter tube arrangement with high resolving power, 392

Trotman-Dickenson, A. F. The decomposition of radicals produced by mercury photo-sensitization, 5868

Trotman-Dickenson, A. F., Birchard, J. R. and Steacie, E. W. R. The reactions of methyl radicals. II. The abstraction of hydrogen atoms from paraffins, 4845

Trotman-Dickenson, A. F. and Steacie, E. W. R. The reaction of methyl radicals. III. The abstraction of hydrogen atoms from olefins, 4846; IV. The abstraction of hydrogen atoms from cyclic hydrocarbons, butynes, amines, alcohols, ethers, and ammonia, 4847

Trott, J. J. *See* Price, W. I. J., 2639

Trounson, E. P., Bleil, D. F., Wangsess, R. K. and Maxwell, L. R. Magnetic resonance in antiferromagnetic materials near the Curie temperature, 490

Trout, E. D. *See* Ham, W. T., Jr, 1090

Troyer, A., de. *See* de Troyer, A.

Truell, R. *See* Levy, S., 7636

Truesdell, C. On the effect of a current of ionized air upon the earth's magnetic field, 1527. Proof that Ertel's vorticity theorem holds in average for any medium suffering no tangential acceleration on the boundary, 8552

Truesdell, C. A. T. On Ertel's vorticity theorem, 6058

Trump, J. G., Cloud, R. W., Mann, J. G. and Hanson, E. P. Influence of electrodes on D–C breakdown in gases at high pressure, 1083

Trumpy, B. *See* Gibson, W. M., 5775

Truter, M. R. Dimensions of the nitrite ion, 9832

Trzebiatowski, W. and Selwood, P. W. Magnetic susceptibilities of urania-thoria solid solutions, 1180

Tsai, B. *See* Cotton, E., 3675

Tsai-Chü. A tentative interpretation of the second maximum in the transition curve for cosmic-ray showers, 8817. *See also* Fréon, A., 445, 1159; Maze, R., 2795

Tscherny, S. D. The motions of a material particle under the force which produces an acceleration $-\mu_1 r^{-2}-3\mu_2 r^{-4}$, 1573
Tsesevich, V. P. The question of the drift of meteoric tracks, 2325
Tsien, H. S. Influence of flame front on the flow field, 6926
Tsiklis, D. S. Compressibility of nitrogen at pressures up to 10 000 atmospheres, 9329. *See also* Krichevskiĭ, I. R., 9328
Tsimring, Sh. E. *See* Kovner, M. A., 8630
Tsomakion, B. F. and Ivlev, V. F. Investigation of non-reversible sudden changes of magnetization, 4537
Tsuchida, R., Kobayashi, M. and Nakamoto, K. Peculiarity of dichroism of aromatic molecular compounds, 6132
Tsuchiya, I. *See* Shimanouchi, T., 975
Tsujikawa, I. *See also* Kanda, E., 4259
Tsujikawa, I. and Kanda, E. Absorption spectrum of crystals at low temperatures. II. Analysis of absorption spectrum of naphthalene crystal, 7721
Tsukkerman, I. I. A magnetic electron-optical system analogous to a plano-concave lens, 9519
Tsuya, N. On the theory of antiferromagnetism. I. Itinerant electron model, 5553. *See also* Hirone, T., 8028, 9594; Watanabe, H., 1829, 5403, 7851
Tsuya, N. and Ichikawa, Y. Dipolar broadening in antiferromagnetic substances, 9588
Tsvetkov, V. A method of determining the geometrical dimensions of macromolecules in a solution, 8564
Tsvetkov, V. N. Ramification and geometrical dimensions of chain molecules in a solution, 8565
Tuck, L. D. The thermodynamics of some non-isothermal systems, 121
Tucker, C. W., Jr. The crystal structure of the β phase of uranium, 9144
Tucker, D. *See* Fry, W. J., 1684, 5189
Tucker, E. B. Neutron thresholds in light elements, 8969
Tucker, W. D. *See* Winsche, W. E., 7282
Tudge, A. P. and Thode, H. G. Thermodynamic properties of isotopic compounds of sulphur, 1026
Tukizi, O. The electric susceptibility of water drops due to ionic polarization, 6192
Tuli, G. D. *See* Joshi, S. S., 5894
Tull, V. F. G. Some experimental measurements of the inner potentials of various crystals, 5931. The calculation of the inner potential of a crystal, 5932
Tuman, V. S. The telluric method of prospecting and its limitations under certain geologic conditions, 3958
Tung, L. H. *See* Scott, E. J., 8562
Tunnicliff, D. D. *See* Stevenson, D. P., 4285
Tunnicliffe, P. R. *See* Fowler, I. L., 384; Hanna, G. C., 4646, 4746; Hurst, D. G., 646
Tuominen, J. A note on the theory of stellar dynamics, 38
Tupman, W. I. *See* Staveley, L. A. K., 2656
Turkevich, A. and Niday, J. B. Radiochemical studies on the fission of Th^{232} with pile neutrons, 9712
Turkevich, J. *See also* Bonner, F., 5854
Turkevich, J., Bonner, F., Schissler, D. and Irsa, P. Stable and unstable isotopes in catalytic research, 1405
Turkevich, J. and Hubbell, H. H. Low angle X-ray diffraction of colloidal gold and carbon black, 3869
Turkevich, J., Hubbell, H. H. and Hillier, J. Electron microscopy and small angle X-ray scattering, 1402
Turnbull, D. Formation of crystal nuclei in liquid metals, 742. *See also* Hoffman, R. E., 5815, 7307
Turner, C. F. and Van Hook, A. The effect of ultrasonic irradiation on the formation of colloidal sulphur and ice, 1436
Turner, J. F. *See also* Cavanagh, P. E., 2985
Turner, J. F. and Cavanagh, P. E. Highly forbidden transitions in the decay of Na^{24}, 7210
Turner, R. C. and Winkler, C. A. Dropping amalgam electrodes, 7365
Turner, R. G. and Nicholls, R. W. Intensity distribution of the first negative ($B^2\Sigma \rightarrow X^2\Sigma$) band system of N_2^+, 5262
Turner, S. E. and Morgan, L. O. Products of the high energy helium ion and deuteron bombardment of tungsten, 4657
Turnock, R. C. The performance of image convertors as high-speed shutters, 9903
Tutihasi, S. *See* Watari, W., 8088
Tutino, C. and Sacerdote, G. G. Broadcasting auditoria with diffusing walls, 5222
Twersky, V. On the nonspecular reflection of plane waves of sound, 158. On the nonspecular reflection of electromagnetic waves, 6361. On the nonspecular reflection of sound from planes with absorbent bosses, 5203
Twigg, G. H. The mechanism of the catalytic hydrogenation of ethylene, 1423
Twiss, R. Q. On Bailey's theory of growing circularly polarized waves in a sunspot, 2334. On oscillations in electron streams, 8053
Tyablikov, S. V. Several remarks concerning the many body problem in the formulation of A. A. Vlasov, 97. The quantum theory of magnetic anisotropy, 6318. On the theory of exchange effects of a particle with the quantum field, 8508. *See also* Bonch-Bruevich, V. L., 6210
Tyler, J. E. A new photometric device, 1713. *See also* di Bernardo, A., 7763
Tyler, W. W. *See also* Sproull, R. L., 7377, 7884
Tyler, W. W. and Sproull, R. L. Optical absorption and photoconductivity in barium oxide, 7693
Tyzhnova, N. V. The problem of the mechanism of the fatigue failure of steel, 9032. *See also* Rovinskiĭ, V. M., 3100
Tyzzer, F. G. *See* Callaway, D. B., 8589

Ubbelohde, A. R. A discussion on detonation: the physical chemistry of detonative reactions, 3127; Some comments on the contribution by Dr. Courtney-Pratt, 3130. *See also* Johnston, R. J., 5154; McDonnell, F. R. M., 3879; McKeown, P. J. A., 8685; Menary, J. W., 8356
Ubbink, J. *See also* Poulis, N. J., 6346
Ubbink, J., Poulis, J. A. and Gorter, C. J. Paramagnetic resonance in iron alums, 7090
Ubisch, H. von. *See* von Ubisch, H.
Uchida, Y., Ueta, M. and Nakai, Y. Studies on the *K* absorption band in the colored rock salt crystal, 6134
Udeschini, P. The equations of Einstein's new unified relativistic theory in the first approximation, 3312. The equations of the second approximation in Einstein's new unified relativistic theory. I–II, 5063. On the mutual action between gravitational and electromagnetic fields, 7505
Uecker, D. F. *See* Lerner, J. L., 8801
Ueda, R. and Ichinokawa, T. On anomalous phase change of ammonium nitrate NH_4NO_3, 2613. Domain structure of tungsten trioxide, 2672. Effect of stress on domain structure of tungsten trioxide WO_3, 6201. On the phase transition in tungsten trioxide, 6585
Ueda, R. and Shirane, G. X-ray study on phase transition of lead zirconate, $PbZrO_3$, 9149
Ueda, Y. *See* Yamasaki, K., 2085
Uemura, Y. *See* Arakatsu, B., 6461; Inui, T., 730
Ueno, S. On the disappearance of the continuous spectrum in the flash spectra, 8462
Ueno, S. and Matsushima, S. On the convection of the stellar photospheres, 8477
Ueta, M. *See* Uchida, Y., 6134
Uhl, W. The natural vignetting of photographic objectives with given stop positions, 8668
Uhler, U. *See* Kleman, B., 184
Ui, N. *See* Watanabe, I., 1856
Ulbricht, H. *See* Meyer, K., 9907
Ullman, R. *See* Riseman, J., 5163
Umanskiĭ, M. M. *See* Kvitka, S. S., 3204
Umeda, K. Asymptotic expression of the Thomas–Fermi function for a packed atom, 8137
Umezawa, H. *See also* Sakata, S., 5114; Yukawa, J., 7520, 8505
Umezawa, H. and Kawabe, R. On the problem of gauge-invariancy and divergence in the theory of elementary particles, I, 5081
Umezawa, M. *See* Horie, H., 8115; Mizushima, M., 8127; Taketani, M., 6389
Umstätter, H. The measurement of viscosity. I. Fundamentals, 1639; II. Measuring apparatus, 3358. *See also* Emschermann, H. H., 4987

Underhill, A. B. A model atmosphere for an early O-type star, 8478. On the luminosity effects of the hydrogen lines in O-type spectra, 8479

Underhill, J. *See* Bradford, R., 8109

Unger, F. The electric field strength between two curved electrodes, 283

Unger, P. *See* Bovey, R., 3477

Ungnade, H. E., Kerr, V. and Youse, E. Deviations from Beer's law in the ultraviolet absorption spectra of some organic compounds, 6861

Unno, W. On the radiation pressure in a planetary nebula. I, 4057. Note on the temperature effect of an interference polarizing filter, 7453. On the equation for the transfer of the Lyman continuum radiation in the circumstellar atmosphere, 8476

Unsöld, A. Cosmic radiation and cosmic magnetic fields. I. Origin and propagation of cosmic rays in our galaxy, 6679

Upham, J. L., Jr. A self-tracking bridge detector for audiofrequency bridges, 9612

Urbain, G. Test on the scatter of measurements in optical pyrometry, 4347

Urban, P. *See also* Ledinegg, E., 287, 2850, 3514

Urban, P. and Schwarzl, F. Theories of particles of higher spin, 8519

Urbin, M. C. *See* McDonald, H. J., 9105

Urey, H. C. The structure and chemical composition of Mars, 1580. *See also* McKinney, C. R., 562

Uri, N. *See* Bates, H. G. C., 2133; Brealey, G. J., 3147; Evans, M. G., 1433

Urmanczy, A. *See* Antonoff, G., 1648

Urquhart, H. M. A. *See* Dekker, A. J., 1345

Ursell, F. Trapping modes in the theory of surface waves, 5150

Ursell, F. and Ward, G. N. On some general theorems in the linearized theory of compressible flow, 889

Ushakov, S. Z. *See* Telesnin, R. V., 8041

Usui, T. On the thermodynamic equation of motion of the two fluid model of helium II, 8697. A note on the pressure equation of the two fluid model of helium II, 9429. *See also* Ishiguro, E., 5580, 7093

Utiyama, R. On the covariant formalism of the quantum theory of fields. I, 66; II, 7516. *See also* Husimi, K., 5088

Uyeda, H. Worldwide distribution of the ordinary component critical frequencies of F2-layer, 6630

Uyeda, R. *See* Kato, N., 7393; Kohra, K., 1519

Uzan, R. *See* Mesnard, G., 923

Uzawa, Z. *See* Hachiya, K., 6074

Vachaspati. Scattering of mesons by nuclear particles, 2376. Some remarks on the use of β-formalism of the meson field for nuclear interactions, 9274. *See* Kohn, W., 7908

Vacher, M. and Lortie, Y. Raman effect—apparatus for working with tiny amounts of liquids, 2567

Vaidya, P. C. A radiation-absorbing centre in a non-statical homogenous universe, 22. Nonstatic solutions of Einstein's field equations for spheres of fluids radiating energy, 6727

Vaidya, W. M. Isotope effect in hydrocarbon flame bands, 5258

Vaĭnshteĭn, B. K. Vector models of crystal structures, 9816. *See also* Pinsker, Z. G., 2190

Vaĭnshteĭn, E. E. *See also* Barinskiĭ, R. L., 9515

Vaĭnshteĭn, E. E., Barinskiĭ, R. L. and Narbutt, K. I. Contribution to the theory of the fundamental X-ray absorption edge of atoms in molecules, 9513. Structure of the X-ray fundamental absorption edge of atoms in molecules, 9514. Magnitude of the sudden change of the coefficient of X-ray absorption, 9516

Vaĭnshteĭn, L. A. The radiation of unsymmetric electromagnetic waves from an open end of a circular waveguide, 2853. On diffraction of waves at an open end of the circular waveguide the diameter of which is considerably greater than the wavelength, 2854

Väisälä, V. Solar radiation intensity at the ascending radiosonde, 3971

Vaĭsenberg, A., Morozov, V. and Khrimyan, A. Reply to V. A. Kravtsov's letter, 7951

Vajk, R. Regional correction of gravity data, 8488

Valadares, M. *See* Frilley, M., 3744–5; Rosenblum, S., 4683

Valatin, J. G. On second quantization. I, 5078; II. Positron theory, 7517. On a formulation of quantum electrodynamics, 8506. On the interpretation of the operators of positron theory, 8532

Valensi, J. Simple calculation of the coefficients of the characteristic function of a reaction turbine in the sonic region, 1658

Valenta, L. Tensor form of piezo-optic and electro-optic equations, 6206

Valente, F. A. The possible existence of a constant third-order difference among the nuclear magic numbers, 2916

Valentine, J. M. *See* Cockroft, A. L., 386

Valkov, V. I. *See* Gross, E. F., 2561

Valladas, G. *See also* Caillat, R., 5492

Valladas, G. and Thénard, J. Differential counting in pulse amplitude analysis, 1134

Vallee, B. L., Reimer, C. B. and Loofbourow, J. R. The influence of argon, helium, oxygen and carbon dioxide on emission spectra in the d.c. arc, 1717

Vallée, R. Reduction of a problem in cybernetics to a problem of pursuit in Hilbert space, 5004. A geometrical interpretation, in Hilbert space, of the properties of periodic or shock states, 5596

Van Allen, J. A. The use of rockets in upper atmospheric research, 6624

Van Allen, J. A. and Singer, S. F. Erratum: On the primary cosmic-ray spectrum, 1152

van Alphen, E. *See* Clay, J., 8819

Van Artsdalen, E. R. *See* Hormats, E. I., 7349; Schweitzer, F. E., 8303

Van Asselt, R. and Williams, D. Further studies of infra-red absorption by homopolar diatomic molecules, 954

Van Atta, C. M., Warshaw, S. D., Chen, J. J. L. and Taimuty, S. I. A double thin lens beta-ray spectrometer, 3562

van Bladel, J. Expandability of a wave-guide field in terms of normal modes, 2856

Van Bladel, J. and Higgins, T. J. Cut-off frequency in two-dielectric layered rectangular waveguides, 3665

van Bommel, A. J. *See* Bijvoet, J. M., 9161; Peerdeman, A. F., 9160

Vance, J. E. *See also* Murphy, G. M., 2649

Vance, J. E. and Whitman, C. I. The vapor pressure of zinc in the range 300°–360°c, 6171

Vand, V. A mechanical X-ray structure-factor calculating machine, 751. Method for determining the signs of the structure factors of long-chain compounds, 3922. A simplified method of steepest descents, 8350. *See also* Dawson, I. M., 4790, 6561

Vand, V. and Bell, I. P. A direct determination of the crystal structure of the T-form of trilaurin, 9175

Vand, V., Morley, W. N. and Lomer, T. R. The crystal structure of lauric acid, 9164

van den Berg, G. J. The remarkable properties of helium, 5360. *See also* de Troyer, A., 1654, 4341; Klinkenberg, P. F. A., 3430, 5250; Lambeir, R., 3530

van den Boomgaard, J. *See* Kroeger, F. A., 1749

van den Bosch, J. C. Some remarks on the analysis of the first U-spark spectrum, 942. *See also* Klinkenberg, P. F. A., 3430, 5250; Mack, J. E., 8141

van den Dungen, F. H., Cox, J. F. and van Mieghem, J. Research on selection-effects attributable to fluctuations of the rotation of the earth, 5054

van den Handel, J. *See* Poulis, N. J., 6346

Vandenplas, A. *See* van Mieghem, J., 7412

van der Hegge Zijnen, B. G. On the construction of hot-wire anemometers for the investigation of turbulence, 8583

van der Maesen, F. *See* Clay, J., 3135

Vandermeerssche, G. *See* Verhaeghe, J., 2827

van der Merwe, J. H. and Verleger, H. Low reflectance coatings and the sensitivity curve of the eye, 2574

van der Reyden, D. The thermal expansion coefficient and the melting point of cubic elements, 3481

van der Schee, A. C. *See* Salomon, G., 7728

van der Tweel, L. H. An accurate electronic whitenessmeter, 8611

van der Velden, H. A. *See* Freeman, G. P., 8795

van der Waarden, M. Stabilization of carbon-black dispersions in hydrocarbons, 1443

van der Waerden, B. L. On the method of saddle points, 8423 van der Wyk, A. J. A. Scattering of light by colloids, 5330

van Eyk, B. J. *See* Salomon, G., 7728

van Geel, W. C. On rectifiers, 9472

van Geel, W. C. and Bouma, B. C. Variation of the dynamic *i*(*V*) characteristics of the Al_2O_3-electrolyte system as a function of frequency, 2686

van Geel, W. C. and Scholte, J. W. A. Capacitance and dielectric losses of an oxide layer deposited on aluminium by anodic oxidation, 4368

van Gorcum, A. H. Theoretical considerations on the conduction of fluctuating heat flow, 1791

van Heel, A. C. S. High precision measurements with simple equipment, 2500; Erratum, 4225. *See also* Frank, C., 5340

van Heerden, P. J. *See* Bloembergen, N., 7955

van Hoof, A. On the possibility to resolve spectroscopically several close binary stars, 5997

Van Hook, A. *See* Turner, C. F., 1436

van Hove, L. *See* Placzek, G., 5808; Nijboer, B. R. A., 7621

van Itterbeek, A. *See also* de Troyer, A., 1654, 4341; Lambeir, R., 3530

van Itterbeek, A. and de Bock, A. Measurements of the absorption of sound in water at 358, 540, 1 074 and 1 790 kc/s, 1674

van Itterbeek, A. and de Greve, L. A small helium liquefier of the expansion type, 5363

van Itterbeek, A., de Greve, L. and François, M. Measurements on the oxidation of thin metallic films (Ni, Fe and Pb), 4779

van Itterbeek, A., de Greve, L. and Lambeir, R. Measurements on the electrical resistivity of iron films at low temperatures, 6209

van Itterbeek, A. and Verhaegen, L. Ultrasonic absorption in normal- and para-hydrogen, 4187

van Kampen, N. G. An asymptotic treatment of diffraction problems. II, 4309. Note on the analytic continuation of the *S*-matrix, 7540

van Kranendonk, J. and Bird, R. B. Pressure-induced absorption in hydrogen, 7174

van Leeuwen, F. J. An automatic reverberation measuring apparatus, 6090

van Lieshout, R. *See* Nijgh, G. J., 9661; Verster, N. F., 8933

van Mieghem, J. Comment on the global energy balance of the atmosphere, 4924. Lateral turbulence in the atmosphere, 6637. Energy balances in dynamic meteorology, 9205. *See also* van den Dungen, F. H., 5054

van Mieghem, J. and Vandenplas, A. Dynamic atmospheric equations in generalized coordinates. Application to the case of spherical coordinates, 7412

van Niekerk, J. N. and Schoening, F. R. L. The crystal structure of *trans* potassium dioxalatodiaquochromiate $K[Cr(C_2O_4)_2(H_2O)_2] \cdot 3H_2O$, 2182. An experimentally determined atomic scattering-factor curve for chromium, 8762

van Nordstrand, R. A., Kreger, W. E. and Ries, H. E., Jr. Adsorption studies of two silica gels and a gel-type catalyst, 9787

van Oort, W. P. A modification of Sucksmith's method for the measurement of susceptibilities of para- and ferromagnetic materials at temperatures between −180°c and 1 100°c, 8838

Van Patter, D. M. *See also* Adamson, R. E., Jr, 2999; Endt, P. M., 8193; Enge, H., 7264; Sperduto, A., 3009; Strait, E. N., 4706

Van Patter, D. M., Buechner, W. W. and Sperduto, A. Energy levels of B^{11} from the $B^{10}(d, p)B^{11*}$ reaction, 4718

Van Patter, D. M., Sperduto, A., Huang, K., Strait, E. N. and Buechner, W. W. Excited state of Be^9 from the $B^{11}(d, \alpha)Be^{9*}$ reaction, 3712

Van Patter, D. M., Sperduto, A., Strait, E. N., Buechner, W. W. Magnetic analysis of the $B^{10}(p, \alpha)Be^7$ reaction, 606

van Riet, R. and de Hemptinne, M. Raman spectrum of CD_3–CD_2H, 2569

van Roosbroeck, W. Theory of the flow of electrons and holes in germanium and other semiconductors, 1053

van Rossum, L. *See* Cüer, P., 600

van Santen, J. H. Order-disorder for Coulomb forces, 1211. Dielectric losses and breakdown of ceramic materials. II. Dielectric losses in ceramic materials 6952

van Santen, J. H. and Jonker, G. H. Electrical conductivity of ferromagnetic compounds of manganese of perovskite structure, 309. Ferromagnetic compounds of manganese with pervoskite structure, 633

Vanselow, W. *See* Fortmiller, L., 1554

van Someren, E. Report of a colloquium on spectroscopy—Strasbourg 1950 (conf. rep.), 3892

van Styvendael, M. *See* Picciotto, E., 4884

van Vleck, J. H. Recent developments in the theory of antiferromagnetism, 6313. Ferromagnetic resonance 7079. *See also* Ollom, J. F., 7190

van Voorhis, S. W. *See* Goff, J. A., 275

van Wijk, W. R. Theory of distillation and other countercurrent processes. II, 9102

Van Winkle, Q. *See* Walker, H., Jr, 8541

van Wyk, C. B. Selection rules for loop processes, 2374

Váradi, P. F. On the conditions of the occurrence of ferromagnetism in metal compounds and in solutions, 4518

Varnerin, L. J., Jr and Brown, S. C. Microwave determinations of average electron energies and the first Townsend coefficient in hydrogen, 402

Vartanyan, A. T. Spectral absorption curves of solid dye-films, 1736

Vašiček, A. Reflection of light by multiple homogeneous thin and thick films, 8656

Vasileff, H. D. and Grayson-Smith, H. Specific heats of certain salts of iron group elements from 65° to 300°k, 272

Vasilev, A. Influence of the character of preliminary work-hardening on the softening of a metal in plastic deformation, 2101

Vassas-Dubuisson, C. Vibration spectrum of a single crystal of lithium sulphate monohydrate, 8652

Vassy, A. *See* Abadie, P., 4950

Vassy, E. *See* Abadie, P., 4950

Vastel, J. *See* Grivet, P., 4422

Vaucouleurs, G. de. *See* de Vaucouleurs, G.

Vaughan, P. A., Sturdivant, J. H. and Pauling, L. The determination of the structure of complex molecules and ions from X-ray diffraction by their solutions: the structures of the group $PtBr_6^{--}$, $PtCl_6^{--}$, $Nb_6Cl_{12}^{++}$, $Ta_6Br_{12}^{++}$, and $Ta_6Cl_6^{++}$, 2907

Vauthier, R. Ion optics of the ion source of mass spectrometers, 1113, 1874

Vavilov, S. I. Remarks on the depolarization of photoluminescence during its decay, 2553

Vdovenko, V. M. *See* Sevchenko, A. N., 6888

Vedam, K. A new method of measuring the elastic constants of solids, 668. Elastic and photoelastic properties of some optical glasses, 669

Vedaraman, S. *See* Ghosh, J. G., 3157

Vedder, W. *See* Ketelaar, J. A., 6124*

Vega, R. *See* Brú, L., 3918

Vegard, L. Properties of the upper atmosphere revealed through spectral analyses of aurorae and twilight, 6647. *See also* Foss, H., 4954

Veith, W. The properties and mechanism of the photoelectric emission of Ca–Sb layers, 1062

Velasco, R. *See* Catalán, M. A., 1721, 3711

Velayos, S. The magnetic moment of the atomic nucleus, 8122

Veldkamp, J. Propagation of sound waves in the sea and in the atmosphere, 2236. On the propagation of sound over great distances, 4007

Veley, V. F. C. *See* Lawford, A. L., 6009

Velichkina, T. S. and Fabelinskiĭ, I. L. A method of measuring the velocity of propagation of ultrasonic waves in liquids, 2463

Vendryes, G. Research into the coincidences between the β and γ rays in the disintegration spectrum of boron 12, 6415. Investigations on the β-activity of boron-12 and lithium-8, 9662

Venkateswaran, C. S. Polarisation of Brillouin components in light-scattering in liquids, 3467. Experimental evidence for the existence of transverse thermal waves in liquids, 9311

Venkateswarlu, P. The rotation-vibration of methyl cyanide in the region $1 \cdot 6\mu$–20μ, 4249. The infrared spectrum of methyl chloroform in the region $1 \cdot 6\mu$–20μ, 4250. The spectrum of iodine excited in the presence of argon, 4265

Venkateswarlu, V. *See* Palit, S. R., 8563

Venkov, M. M. Structural laws of atomic nuclei, 8889

Vennart, J. A simple radium detector for use on radium wards, 2264

Ventouratos, G. F. New methods for the determination of electric constants of vibrating piezo-electric crystals, 9455

Verberg, G. *See* Boelhouwer, J. W. M., 1638

Verde, M. On a possible contribution to knowledge of the nuclear field, 1241. A further theoretical contribution to the photodisintegration of H^3 and He^3, 4726; Erratum, 9635. *See also* Troesch, A., 4101

Vergneau, C. Magnetochemistry of the copper salts of certain organic dibasic acids, 8023. *See also* Ploquin, J., 8022

Vergnolle, J. Conductivity measurements during the electrophoresis of proteins. Electrophoresis measurements by potentiometry, 9499. Electrophoresis measurements by conductimetry, 9500. Measurements of electrophoresis by conductimetry. Attempt to analyse data obtained from the distribution of current between electrodes of varied configurations, 9501

Verhaeghe, J., Vandermeersche, G. and Le Compte, G. Susceptibility and magnetic anisotropy of indium single crystals, 2827

Verhaegen, L. *See* van Itterbeek, A., 4187

Verhoeve-Stokkink, A. J. *See* Capron, P. C., 4732

Verkhovskiĭ, B. I., Dobrotin, N. A., Levintov, I. I. and Khodakov, G. N. Experiments comparing absorption in hydrogen and carbon of particles generating electro-nuclear showers, 8818

Verkin, B. I., Lazarev, B. G. and Rudenko, N. S. The crystallographic anisotropy of the de Haas–van Alphen effect, 488. Periodic field-dependence of the magnetic susceptibilities of metals at low temperatures, 3624. Magnetic properties of metals at low temperatures. I. Periodic variation of magnetic susceptibility of simple crystals of Cd, Be, Mg, Sn and In with magnetic field strength, 9601

Verleger, H. *See* Marais, E. J., 1727; Naudé, S. M., 187, 1728; van der Merwe, J. H., 2574

Verma, A. R. Spiral growth on carborundum crystal faces, 7374. Observations on carborundum of growth spirals originating from screw dislocations, 9810. Growth spirals on carborundum crystals, 9812

Verma, G. S. Ultrasonic classification of organic liquids, 910. Effects of humidity on ultrasonic absorption in air at 1·46 megacycles, 1676. Ultrasonic absorption in organic liquids, 8595

Vernon, W. H. J. Adsorption of water vapour on solid surfaces, 7355

Vernotte, P. The ideal method for the determination of a physical characteristic is the analysis of an experimental curve. Examples, 8435. How to choose the diameter in measurements of the thermal conductivity by the bar methods, 9414

Vernov, S. N. and Charakhchyan, A. N. An investigation of the structure of showers produced by primary cosmic rays in the stratosphere, 427

Vernov, S. N., Grigorov, N. L. and Charakhchyan, A. N. Investigation of cosmic rays in the stratosphere, 1899

Vernov, S. N. and Kulokov, A. M. Angular distribution of cosmic rays in the stratosphere, 447

Verschaffelt, J. E. Onsager's principle, 1025. On the statics of fluids, 4140. The thermo-mechanics of ionized fluids, 4355. The thermo-mechanics of transport phenomena, 5371. Potential energy in thermomechanics, 6183. On the thermodynamics of irreversible phenomena, 6184. On the affinity of fluid flow, 6185. On the thermal effect of diffusion, 8567

Verster, N. F. Spherical aberration of a double focusing beta ray spectrometer, 2733. *See also* Nijgh, G. J., 9661

Verster, N. F., Nijgh, G. J., van Lieshout, R. and Bakker, C. J. Measurement of the radiations from ^{131}I and $^{131}Xe^*$ with a lens type beta-ray spectrometer, 8933

Verwey, E. J. W. Semi-conducting materials. Oxidic semi-conductors, 7865

Vestin, R. and Olsson, O. Laboratory apparatus for flow experiments. II. Precision device for continuous slow-speed feeding and evaporation of volatile liquids, 3389

Vestin, R., Olsson, O. and Somersalo, A. Laboratory apparatus for flow experiments. I. Adjustment of constant gas flow by critical orifices, 3388

Veverka, J. *See* Heller, B., 1142

Viallard, R. Determination of sorbed water by exchange with deuterium oxide. Extension of the exchange method to the study of macromolecular structures, 9759

Vichnievsky, R. *See* Salé, B., 8283

Vidal, J. M. T. Thermal transformation of anisotropic bodies, 8687. Thermal dilatation of bodies, 8688

Vidal Abascal, E. Internal structure and energy of the stars, 7485

Vidale, M. and Schein, M. The intensity of the total and of the hard component of the cosmic radiation as a function of altitude at geomagnetic latitudes of 28°N and 55°N, 6307

Videnskiĭ, V. G. *See* Eĭdus, L. Kh., 2786, 3608

Viehböck, F. P. *See* Ehrenhaft, F., 335

Vieille, E. *See* Schérer, M., 1121

Vieilledent, E. *See* Dubois, G., 7615

Vieweg, R. *See* Gottwald, F., 2413

Vigean, F. Extinguishing action of long wavelength radiation in electrophotoluminescence. I. Experimental results, 4300

Vigean, F. and Curie, D. Extinguishing action of long wavelength radiation in electrophotoluminescence. II. Interpretation of results, 6139

Vigier, J.-P. Geometrical introduction of elementary particles in unitary affine theory, 6028

Vigneron, L. Geometrical method of calculating the back scattering of particles, 3571. Ranges of the two uranium fission fragments in photographic emulsion, 3784. Calculations of the range-energy relation for protons up to high energies in Ilford C2 emission, 5482. *See also* Bogaardt, M., 3581

Vigón, M. T. Variation of the dimensions of photographic images as a function of exposure, 5966

Vigoureux, P. Ultrasonics, 3415

Vigoureux, P. and Booth, C. F. Quartz vibrators, 2459

Vilbig, F. An apparatus for speech compression and expansion and for replaying visible speech records, 1697

Vilím, F. *See* Brož, J., 8018

Villard, O. G., Jr. *See* Manning, L. A., 763

Villari, C. *See* Milone, C., 420

Villars, F. *See* Primakoff, H., 7532

Vinaccia, G. The heliomeridianscope, 1574

Vincent, A. M. *See* Meulemans, G., 8182

Vincent, J. Contribution to the study of the intensity of rays and of absorption bands in the infra-red, 8627

Vineyard, G. H. Concerning certain anomalous small angle diffraction effects, 5328. Patterson transforms and the interpretation of X-ray scattering from fibers, 7390

Visconti, A. Comments on a solution of the wave equation, 92. On de Broglie's subtractive field and Feynman's interaction function, 3328

Vishneskiĭ, V. F. *See* Azimov, S. A., 8814

Vishnitskaya, L. A. *See* Bartenev, G. M., 2088

Visvanathan, S. Thermal expansion at low temperatures, 4329. Effect of variable mass of the electron on the space-charge limited current in a diode, 8804

Vitense, E. The structure of stellar atmospheres. IV, 4065. On the average condition and the physical properties of stellar atmospheres in their dependence on effective temperature and gravity, 7489

Vitkevich, V. V. New method of investigating the solar corona, 8458

Vitman, F. F. and Zlatin, N. A. Resistance to deformation of metals at velocities 10^{-6}–10^2 m/sec. III, 8275

Vlam, C. C. Fine structure in the emission spectrum of manganese activated zinc silicate, 7766

Vlasov, A. A. Theory of nonlocalized particles. Remarks concerning the article of S. V. Tyablikov, 98

Vlasov, A. A. and Bazarov, I. P. Theory of losses, 6990

Vlasov, A. A. and Yakovlev, V. A. Theory of the crystalline state, 7383

Vlasov, K. B. Theory of the coercive force, 6321. *See also* Shur, Ya. S., 509

Vlasov, K. B. and Shur, Ya. S. Temperature dependence of the coercive force in monocrystals of transformer steel, 6344

Vlasov, N. A. Angular distribution and polarization of annihilation γ-emission, 3749. *See also* Artemov, K. P., 6450

Vleck, J. H. van. *See* van Vleck, J. H.

Vodar, B. *See also* Bauple, R., 2525; Gilles, A., 939; Mostovetch, N., 7887; Robin, S., 1656, 6105, 7623, 8626, 9104; Romand, J., 8702; Safary, E., 5288, 9374, 9802

Vodar, B. and Astoin, N. New source of light for the far ultra-violet, 1718

Vodieka, V. Heat conduction in a segment of a cylinder, 1009. Heat conduction in laminated spherical and cylindrical bodies, 1011

Voelz, F. L., Meister, A. G. and Cleveland, F. F. Force constants and calculated thermodynamic properties for SiF_4, 8881

Voelz, K. Damping in acoustic resonators, 6812

Voet, A. and Suriani, L. R. Note on the dielectric constant of solutions of polystyrenes and polyisobutylenes in toluene, 1817. Dielectrics and rheology of dispersed magnetized particles, 8721

Voevodskiĭ, V. V. Empirical equations for calculating dissociation energies of C–H and C–C bonds in saturated hydrocarbon molecules and in free aliphatic radicals, 9629

Vogel, R. Q. *See* Martin, A. E., 7655

Vogel, T. Topological methods in the treatment of problems of non-linear oscillations, 2457. Vibrations of closed spaces with deformable elastic walls, 2458

Vogt, E. *See* Elsas, A., 8079

Voigt, A. F. *See* Hein, R. E., 567

Voigt, H.-H. On the polarization of radiation in stellar atmospheres, 4066

Voikhanskiĭ, M. E., Dzhelepov, B. S. and Sliv, L. A. Nature of the beta decay of H^3, 564

Voisin, A. G. Penetrating showers of cosmic rays, 2792, 7995

Võit, H. Phase differences between theoretical and observed tides, 821

Vold, M. J. The application of the mass law to the aggregation of colloidal electrolytes, 3868

Vold, R. D., Coffer, H. F. and Baker, R. F. Direct observation of gel structure with the electron microscope, 4788

Volet, C. and Cabrera, N. Two interferometric techniques, 6896

Volger, J. Note on the Hall potential across an inhomogeneous conductor, 1209. Semi-conducting materials. Some properties of (La, Sr)MnO_3, 7866

Volk, J. A. The photoelectric seismograph, 1522

Volkenshtein, F. F. Some particularities of adsorption brought about by "thermal disorders" on the surface of crystals, 3197

Volkenshteĭn, F. F. and Bonch-Bruevich, V. L. The behaviour of electrons in ionic crystals, 6957

Volkenshteĭn, M. V. and Byutner, E. K. Optically active crystals, 6154

Volkov, D. I. and Skorobogatov, V. I. Measurement of magnetostriction by wire strain gauges, 6372

Vollrath, R. E. *See* Donoghue, J. J., 4136

Volman, D. H. The photochemical reaction between ozone and hydrogen peroxide, 5869. Methyl radical induced polymerization of gaseous butadiene, 6528

Volyak, L. D. Investigation of the temperature dependence of the surface tension of water, 2421

v. Baeckmann, W. *See* Severin, H., 5603

Von Batchelder, F. W. and Stauss, H. E. A method for annealing metal powders without sintering, 7440

v. Békésy, G. The coarse pattern of the electrical resistance in the cochlea of the guinea pig (electroanatomy of the cochlea), 4971. Microphones produced by touching the cochlear partition with a vibrating electrode, 4972. D.c. potentials and energy balance of the cochlear partition, 9874

von Borries, B. The graduation of the ultramicroscopic picture, 5460

v. Brockdorff, U. and Kirsch, K. Electric microbalance, 2404

von Dardel, G. A precision determination of the half-life of radium C′, 574, 1266

von Eller, G. On a new device for the summation by an optical method of Fourier series in several dimensions, 5002. Two uses of the optical machine for the calculation of Fourier series, 8352

von Engel, A. A survey of recent advances in discharge physics, 3535. *See also* Francis, G., 347; Harries, W. L., 5436

v. Fragstein, C. Light "beats"—a note on a work by E. Rüchardt, 9395

von Friesen, S. and Kristiansson, K. Photo-electric measurements of the density of tracks in nuclear emulsions, 778. Measurements of mass ratios in nuclear emulsions, 9719

von Gericke, O. On the change with time of photoelectric currents in alkali halide crystals, 1844

von Heine-Geldern, R. *See* Pugh, E. M., 4990

von Hippel, A. Ferroelectricity, domain structure, and phase transitions of barium titanate, 300. *See also* Mathias, B., 8711

von Hippel, A. and Bloom, M. C. The electroplating of metallic selenium, 694

von Hofe, C. Efficient graticule illumination, 6906

von Kármán, T. *See also* de Kármán, T.

von Kármán, T. and Duwez, P. The propagation of plastic deformation in solids, 680

v. Keussler, V. On a simple arrangement for the quantitative determination of the course of absorption in the ultraviolet region, 6117

von Kilinski, E. The recording of field strengths of atmospheric electricity, 6650

von Laue, M. On Minkowski's electrodynamics of moving bodies, 830. Light beats, 990. Material waves, 4111

v. Mohrenstein, A. New calculation of the H_2 molecule, 1214

Vonnegut, B. *See* Reynolds, S. E., 5940

v. Roka, E. G. On an indirect influence of solar activity on the intensity of cosmic rays, 2798. The sun's activity and cosmic rays, 6309

v. Siemens, W. *See* Brix, P., 1244

Vonsovskiĭ, S. V. and Rodionov, K. P. The theory of Goldhammer's phenomenon in ferromagnetism, 3673

Vonsovskiĭ, S. V. and Sokolov, A. V. Superficial photoelectric effect in ferromagnetics, 3629

von Ubisch, H. A 180° mass spectrometer for biochemical work, 3576. Mass spectrometric determination of deuterium by means of phosphine, 4623. On the conduction of heat in rarefied gases and its manometric application. I, 8679; II, 8680

Voogt, A. H. de. *See* de Voogt, A. H.

Voorhis, S. W. van. *See* van Voorhis, S. W.

Vorontsov-Velyaminov, B. A. Distribution and origin of the hot giants in our galaxy and other spiral systems, 2347. Visibility corridors and regional differences of the stellar structure in the galaxy, 8473

Voter, R. C. *See* Godycki, L. E., 9179

Votruba, V. and Muzikář, Č. On the decay of μ-mesons, 5799

Vousden, P. The structure of the ferroelectric niobates and tantalates, 2180. A study of the unit-cell dimensions and symmetry of certain ferroelectric compounds of niobium and tantalum at room temperature, 9152

Voyvodic, L. *See also* Pickup, E., 465, 2278, 2863, 3620, 5543, 8829

Voyvodic, L. and Pickup, E. Multiple scattering of fast particles in photographic emulsions, 4497. Multiple scattering of electron pairs from (Li, p) gamma-rays in photographic emulsions, 4685

Vreedenberg, H. A. The adsorption of carbon disulphide vapour flowing through a tube filled with activated charcoal, 714

Vries, H. de. *See* de Vries, H.

Vrkljan, V. S. Does there exist in M. de Broglie's theory of the spin 1 particle a quantity analogous to the Hertz vector? 6741*. Does the de Broglie wave-equation satisfy the relativity principle? 7553. On the relation between the three Dirac matrices, 8518. On the Schrödinger "Zittern" of the de Broglie particle with spin 1, of meson type, 9276

Vtorov, E. N. *See* Biberman, L. M., 371

Vulfson, K. S. Apparatus for the optical projection of the filament of an electrometer, 2593. An absolute method of measuring the black-body temperature, 7650

Vulfson, K. S. and Libin, I. Sh. Dilatation of the channel of the impulse discharge in inert gases, 6988

Waarden, M. van der. *See* van der Waarden, M.

Wada, E. and Nakane, H. Effect of ultrasonic waves on high polymeric substances, 5193

Wada, M. Fundamental studies on interfacial tensions in flotation. II, 6060; III. Tilting-plate method of determining contact angle and the wetting tension of aqueous solutions of frothers for paraffin-wax, 6061; IV. Suspended-plate method of determining wetting tension and the time variation of wetting tension of glass at water-air interface, 6062; V. Flow of liquids under interfacial tension, 7596. The relation between cosmic-ray intensities and heights of isobar levels. I, 9573. *See also* Sekido, Y., 8446

Wada, Y. On the steady surface ripples of a cylindrical flow, 873. On the standing varicose and sinuous ripple of a cylindrical flow, 2415

Wada, Y., Shimbo, S. and Oda, M. Dispersion of ultrasonic velocity in the liquid fatty acids, 1671. Ultrasonic measurement of solvation, 2431. Dispersion of ultrasonic velocity in the liquid higher fatty acids, 2464

Wade, F. The measurement of high vacuum by electrical methods, I. 2439; II. 3394

Wadey, W. G. *See* Schultz, H. L., 7932

Waele, A. de. *See* de Waele, A.

Wäffler, H. *See* Blaser, J. P., 9665; Nabholz, H., 7259

Wagenbreth, H. *See* Kockel, B., 6841

Wagener, H. *See* Tronnier, H., 6915

Wagener, S. Efficiency and mechanism of barium getters at low pressures, 6786

Wagener, S. and Johnson, C. B. Calibration of ionization gauges for various gases at low pressures, 8576

Wagenknecht, F. On the dielectric and magnetic properties of several ferrites at high frequencies. I, 7839; II, 8720

Waggoner, M. A. Internal conversion of gamma-ray from Cs^{137}, 2019. Radioactive decay of Cs^{137}, 7213. *See also* Moon, M. L., 596

Waggoner, M. A., Moon, M. L. and Roberts, A. Internal conversion of gamma-rays from Co^{60}, Cs^{134}, Zn^{65}, 2018

Waghorn, G. C. S. *See* Bradley, R. S., 3486

Wagner, C. Diffusion of lead chloride dissolved in solid silver chloride, 657. Thermodynamic investigations on ternary amalgams, 5811

Wagner, C. D. *See* Stevenson, D. P., 4285, 4483

Wagner, D. Study of defects of homogeneity by the shadow method, 244

Wagner, E. H. On the structure of the streaks in the Kossel–Mollenstedt electron interference patterns with a convergent beam, 6601. *See also* Fues, E., 5929, 6600

Wahba, M. and Nashed, S. Change with temperature of the heat of wetting of dry cellulose in water, and its bearing on the specific heat of the adsorbed water and of the swollen cellulose, 3153

Wahlig, C. *See* Russell, B. R., 4564

Wähnl, M. A theoretical investigation of evolution of stellar clusters 4056

Wainwright, C. The use of the Geiger–Müller counter X-ray spectrometer in an X-ray laboratory, with special reference to automatic recording, 7000

Wait, G. R. Measurements by airplane of electric charge passing vertically through thunderstorms to ground, 9857. *See also* Gish, O. H., 3996

Wait, J. R. Transient electromagnetic propagation in a conducting medium, 6360

Wajid, M. A. *See* Bawn, C. E. H., 4873

Wakabayashi, T. Photo-elastic method for determination of stress in powdered mass, 1780

Wakatsuki, T. and Sugimoto, K. On the scattering of fast neutrons from Li–D reactions, 8204

Wakefield, A. J. Statistics of the simple cubic lattice, 8836

Wakkad, S. E. S. El. *See* El Wakkad, S. E. S.

Walcher, W. *See* Brix, P., 4597

Walchli, H., Livingston, R. and Herbert, G. The nuclear magnetic moment of I^{129}, 5664

Waldman, B. *See* Schillinger, E. J., Jr, 7278; Wolicki, E. J., 5779

Waldmeier, M. Statistics of the green coronal rays, 35. Spectrophotometric classification of protuberances, 3285. Radio solar-research (conf. rep.), 4046. The form of the monochromatic corona, 5992. The new coronal line 5 445 Å, 7474

Waldorf, S. K. *See* Hess, W. B., 1645

Wales, M. Sedimentation equilibrium in concentrated polymer solutions, 6070

Walker, A. C. Growing piezoelectric crystals, 2675. Growing quartz crystals for military needs, 5903

Walker, D. High energy photo-protons from carbon, 4722. Analysis of high energy proton spectra by means of a stack of photographic plates, 8976. *See also* Littauer, R. M., 6463

Walker, G. B. Congruent space charge flow, 2730

Walker, H., Jr and Van Winkle, Q. A microphotometric area determinator, 8541

Walker, J. G. *See* Bozorth, R. M., 507; Williams, H. J., 8043

Walker, M. J. and Raymond, R. C. Measurement of Faraday effect and Cotton–Mouton effect using transient magnetic fields and a photo-multiplier type compensator, 1953

Walker, R. A. On the interpretation of relaxation time measurements in gas mixture, 4578

Walker, R. L. *See* McDaniel, B. D., 3020

Walker, S. P. *See* Greisen, K., 1912; Walker, W. D., 1913

Walker, W. D. *See also* Greisen, K., 1912

Walker, W. D., Hammel, J. E., Sinclair, R. M. and Sorrel, J. D. Electromagnetic interactions of μ-mesons, 8226

Walker, W. D., Walker, S. P. and Greisen, K. Mean free path of penetrating shower producers, 1913

Walker, W. H. *See* Kinsey, B. B., 3752, 5728, 8177

Wall, F. T., Drenam, J. W., Hatfield, M. R. and Painter, C. L. Light scattering studies on coiling polyelectrolytes, 5892

Wall, F. T., Stent, G. S. and Ondrejcin, J. J. The electrolyte transference properties of polymeric acids, 1462

Wall, N. S. *See* Goldhaber, M., 8920

Wallace, J. R. *See* Burgy, M., 3054

Wallace, R. 90-MeV neutron-proton scattering at large proton angles, 4762

Wallace, W. E. and Fineman, M. A. The mutual solid solubilities of potassium chloride and potassium bromide, 3109

Wallenquist, Å. Some preliminary results of photoelectric determinations of colours and magnitudes in double stars, 816

Waller, M. D. New method of forming powder striations, 3202

Walling, J. C. *See* Hoare, F. E., 5575

Wallis, R. *See* Hart, R. W., 4354

Wallwork, S. C. and Powell, H. M. Crystal structure of 44′-dihydroxydiphenyl, 8363

Walnut, T. H., Jr and Carpenter, G. B. The X-ray scattering from a hindered rotator, 1491

Walsh, A. Design of multiple-monochromators, 6847. *See also* Pulford, A. G., 8631

Walsh, A. D. Factors affecting bond strengths. I. A possible new definition of electronegativity; II. Empirical relations involving force constants and ionization potentials, 7157. *See also* Downs, D., 8282; Hammond, V. J., 7756; Price, W. C., 5289; Teegan, J. P., 3447, 8905

Walsh, E. G. and Wolff, H. S. Heterochromatic photometry using rotating filters and a colour wedge, 6094

Walsh, J. M. and Matsen, F. A. Molecular orbital calculations for H$_3$, 5648

Walsh, T. G. and Piccioni, O. Latitude and altitude dependence of the local hard showers of cosmic rays, 1917

Walske, M. C. and Bethe, H. A. Asymptotic formula for stopping power of K-electrons, 8140

Walt, M. *See* Fields, R. E., 8981

Walter, K. The distribution of line-width-deduced rotational velocities for A-stars, 7491. *See also* Aeppli, H., 6445; Gliese, W., 7477

Walter, M., Huber, O. and Zünti, W. Experiments on the angular correlation of successive nuclear radiations, 2940

Walters, A. G. On the propagation of disturbances from moving sources, 1668

Walters, M. C. *See* Fremlin, J. H., 468

Walton, W. H. *See* Sawyer, K. F., 654

Wandersleb, E. The rôles of the cosine law and the exit pupil in the light distribution in the field of a photographic objective, 6914

Wang, C. F. *See* Keller, K. K., 4713

Wang, J. H. Self-diffusion and structure of liquid water. I. Measurement of self-diffusion of liquid water with deuterium as tracer, 5160

Wang, P. K. S. Note on reduction of background fog in nuclear emulsion plates, 2277

Wang, T. J. Cavity ionization chamber for measurement of absorbed X-radiation energy, 1880

Wangsness, R. K. On the magnetic moments of the proton and neutron, 2379. *See also* Trounson, E. P., 490

Wanless, S. D. *See* Leighton, R. B., 8810

Wannier, G. H. On the motion of gaseous ions in a strong electric field. I, 7044. *See also* Hornbeck, J. A., 5507

Wantier, G. *See* Lacourt, A., 8332

Wantuch, E. Neutron-deuteron scattering at 4·5 and 5·5 MeV, 648

Wapstra, A. H. The binding energy of ^{4}He, 1230. The atomic masses of H^1D^2 and C^{12}, 6398. Binding energy surfaces in the region of the magic numbers $Z = 82$ and $N = 126$, 8891

Ward, A. F. H., Neale, S. M. and Bilton, N. E. Viscosity of liquids at high rates of shear, 1640. Viscosity of lubricating oils at high rates of shear, 3843

Ward, A. H. and Jensen, P. G. Measurement of radioactivity in human breath, 6665

Ward, G. N. *See* Ursell, F., 889

Ward, J. C. Quantum effects in the interaction of electrons with high frequency fields, 836. On the renormalization of quantum electrodynamics, 1605

Ward, J. C. and Wilks, J. The velocity of second sound in liquid helium near the absolute zero, 3497

Ward, S. G. *See also* Eveson, G. F., 2409

Ward, S. G. and Whitemore, R. L. Studies of the viscosity and sedimentation of suspensions. I. The viscosity of suspension of spherical particles, 865; II. The viscosity and sedimentation of suspensions of rough powders, 2408

Ware, A. A. A study of high-current toroidal ring discharge, 3536. *See also* Cousins, S. W., 3539

Warhurst, E. The ionic character of bonds and bond properties, 7158

Warhurst, E. and Whittle, E. Dipole moment and ionic character, 7167

Wark, W. J. Spark analysis of semi-microsamples, 7366. Cyanogen rarefaction using solid CO_2, 7798

Warminsky, R. *See* Broser, I., 5298

Warmoltz, N. On the application of a Philips ionization gauge type of ion source in a mass spectrometer leak detector, 9540

Warnecke, R. and Doehler, O. On the interaction between a travelling e.m. wave and an electron beam propagating in a cylindrical system perpendicularly to mutually perpendicular constant electric and magnetic fields, 2874

Warner, J. The application of radar to geodetic surveying, 2354

Warren, B. E. *See* Keating, D. T., 3910; Norman, N., 4784

Warren, D. R. *See* Egerton, A., 2118

Warren, E. S. *See* Guptill, E. W., 546

Warren, J. B. *See also* Argyle, P. E., 3743, 3754

Warren, J. B. and Griffiths, G. M. Angular correlation of annihilation radiation from positrons decaying in several substances, 8953

Warren, J. M. and Egan, J. P. On the accuracy of the method of best beats for determining the intensity of a tone, 4210

Warren, S. and Brues, A. M. Protection against radiation hazards, 1986

Warrington, H. G. Developments in magnesium alloys, 7439

Warshaw, S. *See* Jaffey, A. H., 5706

Warshaw, S. D. The β-spectrum of C^{14}, 1282. *See also* Van Atta, C. M., 3562

Warshaw, S. D. and Chen, J. J. L. The probable energy loss of electrons in matter, 1107

Warshaw, S. D., Chen, J. J. L. and Appleton, G. L. The beta-spectrum of P^{32}, 2011

Warwick, C. The effect of irregular absorption on galaxy distribution, 45

Warwick, G. A. Controlling hardness and microstructure during induction hardening, 3074

Wasastjerna, J. A. Atomic arrangements with given number of neighbours, 2879. The configuration partition functions for binary solid solutions and the equilibrium degrees of local and long range order, 3056. On the theory of the heat of formation of solid solutions, 5633

Waser, J. The choice of triclinic lattice elements, 9805

Waser, J. and McClanahan, E. D., Jr. The crystal structure of $NaPt_3O_4$, 4910

Washburn, E. R. and Dunning, H. N. The determination of diffusion coefficients by measurements of surface tension, 5153

Washer, F. E. *See* Hotchkiss, R. N., 8612

Wasiutyński, J. Studies in hydrodynamics and structure of stars and planets, 4067

Wasow, W. Random walks and the eigenvalues of elliptic difference equations, 3263. On the mean duration of random walks, 7452

Wassenaar, J. P. *See* Michels, A., 1635

Wasserrab, T. Properties of the positive column at low pressures, 346. On the theory of double layers in low pressure gas discharges, 3548. Gas heating in low pressure gaseous discharges, 5434

Wasserstein, B. Cube-edge of uraninites as a criterion of age? 9834

Wataghin, A. *See* Meyer, H. A., 5530, 9569

Wataghin, G. On the penetrating showers, 426. On the quantum theory of fields. I, 9265. *See also* Garelli, C. M., 450, 453

Watanabe, H. Cation arrangement of magnetite at low temperatures, 4523. A note on the theory of the coercive force, 8045. The temperature dependence of [the] magnetization of ferrites on the basis of the theory of ferro-magnetism, 8834. *See also* Hirone, T., 8028

Watanabe, H. and Tsuya, N. On the electrical conductivity of magnetite, 1829, 5403. On the properties of chromium sulphides and iron sulphides. I, 7851

Watanabe, I., Ui, N. and Nakamura, M. The temperature dependence of the electrophoretic mobility of horse serum albumin, 1856

Watanabe, J. *See* Yamamoto, M., 4889–90

Watanabe, K. Properties of a CaSO : Mn phosphor under vacuum ultraviolet excitation, 8649. *See also* Tousey, R., 9209

Watanabe, M. and Mida, J. Ionization of the negative oxygen ion by electron impact. III, 403

Watanabé, T., Atoji, M. and Okazaki, C. The crystal structure of hexammine-cobaltic hexachlorothalliate, $Co(NH_3)_6TlCl_6$, and hexammine-cobaltic hexabromothalliate $Co(NH_3)_6TlBr_6$, 1508

Watanabe, Y. Some remarks on the equation of thermionic emission, 3598. *See also* Nakano, T., 5095; Nimura, T., 4196

Watanabe, Y., Takagi, E. and Katsura, S. On the equation of thermionic emission of the oxide-coated cathode, 4492

Watari, T. Considerations on ionic elevation of fluidity and ionic mobility, 1425

Watari, W. *See* Araki, G., 8088

Watase, T. *See* Murata, H., 976

Watase, Y., Miyake, S., Suga, K. and Kusumoto, O. A high pressure cloud chamber observation of cosmic ray at 2 740 m. elevation, 8825

Waters, J. F. Instrument for measuring the slope of graphs, 5001

Watson, A. T. The relation of the frequency of ultraviolet absorption to the reduction potential of aromatic hydrocarbons, 955

Watson, C. D. *See* Tompkins, P. C., 2149*

Watson, H. H. H. *See* Fry, D. W., 1094; Goward, F. K., 3026

Watson, J. H. L., Léger, A. E. and Ouellet, C. On the growth and properties of the cuprene fiber, 1461

Watson, J. H. L. and Preuss, L. E. X-radiation from electron microscopes, 1089

Watson, K. *See* Brueckner, K., 4692

Watson, K. M. *See also* Fernbach, S., 7291

Watson, K. M. and Brueckner, K. A. The analysis of π-meson production in nucleon-nucleon collisions, 6748

Watson, K. M. and Hart, E. W. On the use of the Tomonaga intermediate coupling method in meson theory, 88

Watson, K. M. and Richman, C. On the angular distribution and the polarization of the deuteron in the reaction $p + p \rightarrow d + \pi^+$, 9691

Watson, K. M. and Stuart, R. N. On the γ-ray spectrum resulting from the absorption of π^- mesons in deuterium, 5739

Watson, R. B. On the directional patterns of polystyrene rod antennas, 2861. *See also* Cheney, M. G., Jr, 5605

Watson, W. W. *See* Donaldson, J., 6780; Schuette, O. F., Jr, 3713; Zucker, A., 3012

Watts, B. N. *See* James, J. A., 2084

Watts, H. M. *See* Bearden, J. A., 2356–7, 3308, 7501

Watts, R. J. Millimicroampere current integrator for a cyclotron, 7958

Wauchope, K. *See* Stewart, M. T. S., 8240

Wax, N. On amplitude bounds for certain relaxation oscillations, 3404. *See also* Taub, A. H., 399, 2774

Way, K., Fano, L., Scott, M. R. and Thew, K. Nuclear data, 2938

Way, K., Wood, M. and Thew, K. Nuclear data, 6402

Waymouth, J. F., Jr. Deterioration of oxide-coated cathodes under low duty-factor operation, 2778

Wayne, L. G. and Yost, D. M. Kinetics of the rapid gas phase reaction between NO, NO_2, and H_2O, 4829

Weale, R. A. Surface tension of liquid metals, 9309

Weaver, B. Mass assignment of natural activity of samarium, 1994

Weaver, E. R. Electrical measurement of water vapor with a hygroscopic film, 9797

Weaver, H. E., Jr. *See* Dharmatti, S. S., 8132

Weaver, H. F. The transmittance of a prism, 5234

Weaver, K. S. Measurement of photographic transmission density, 925

Webber, R. T. and Steele, M. C. The thermoelectromotive force of tin at the superconducting-normal junction, 1066

Weber, A. H. Recent application of neutron diffraction, 3948. *See also* Heller, R. B., 1502, 2748; Stauder, W. V., 5822

Weber, D. *See also* Penner, S. S., 6873–4, 9382

Weber, D. and Penner, S. S. Integrated absorption of the fundamental of CO from measurements using self-broadening of rotational lines, 7690

Weber, E. Electromagnetic fields. Theory and applications. I. Mappings of fields, 1941

Weber, E. H. *See* Heller, R. B., 8932

Weber, G. Illumination of photographic darkrooms, 2270

Weber, H. Additive colouring of MgO crystals, 7370. *See also* Pick, H., 1473

Weber, J. Pressure broadening of an ammonia inversion line for foreign gases, 9383

Weber, J. and Laidler, K. J. The variation of rate of desorption with extent of surface coverage, 2122. Kinetics of the ammonia-deuterium exchange by a microwave method, 4815. Microwave spectroscopic investigation of the kinetics of the heterogeneous ammonia-deuterium exchange, 9047

Weber, M. A new vibration measuring apparatus and its uses, 7626

Weber, N. E. *See* Green, L. C., 7192

Weber, P.-E. A reciprocal diffraction effect, 231. The angle of incidence as a function of the angle of deviation and the refractive indices, 928. Phenomena in barrier-layer photo elements and a resulting theory of the barrier-layer photo- and rectifier-effect, 9480

Weberling, R. *See* Bastian, R., 9107

Webster D. L. and Newton C. M. Masses of carriers in conductors, 7847

Webster, F. A. The influence of interaural phase on masked threshold. I. The role of interaural time-deviation, 7431

Webster, F. V. *See also* Millership, R., 508

Webster, F. V. and Driver, K. S. High frequency permeability of ferromagnetic materials, 2826

Webster, W. M. *See* Malter, L., 8754

Wedding, J. W. *See* Haynes, S. K., 4441

Weddle, O. H. *See* Nielsen, C. E., 9558

Weekes, K. *See* Bracewell, R. N., 4559

Wegener, K. On the analysis of observations of solar radiation, 3983

Wegener, P. and Lundquist, G. Condensation of water vapor in the shock tube below 150°K, 3490

Wegener, P., Reed, S., Jr, Stollenwerk, E. and Lundquist, G. Air condensation in hypersonic flow, 7616

Wegmann, L. On the question of rendering atomic dimensions visible in the electron microscope, 4438

Wehner, G. Electron plasma oscillations, 6359. Plasma oscillations, 9610

Wei, J. P. N. Narrow air showers of cosmic rays. II. Absorption measurements, 436

Wei, J. P. N. and Montgomery, C. G. Narrow air showers of cosmic rays. III. Further absorption measurements, 2788

Weibull, H. Propagation of sound waves in heterogeneous material, 7628

Weiffenbach, G. C. *See* Talbot, F. L., 4707

Weil, H. Chromatographic technology in radioisotope separation. I. Chromatographic equipment; II. Applications, 3155. *See also* Poritsky, H., 7893

Weil, L. Coercive field of isolated and connected ferromagnetic grains, 1189. Ferromagnetic anomaly in the thermal expansion of ferrites, 6328. A new method of measurement of the true specific heats of non-metallic materials, 6933. The coercive field, 7066. Coercive force of ferro-nickel powders. Influence of compression and of sintering, 8839. The variation of the Young's modulus of a ferrite [of Ni and Zn] with density, 9025

Weil, L. and Bochirol, L. The measurement of Young's modulus for ferrites, 7314

Weil, R. and Read, H. J. Electron-microradiography of electrodeposited metals, 777

Weill, J. *See* Brière, M., 9549

Weinberg, L. Solutions of some partial differential equations (with tables), 7449

Weinreich, O. A. Emissivity changes of thoria cathodes, 1149

Weinstein, A. On surface waves, 3376. *See also* Bonner, F. 2765

Weinstein, B. K. *See* Vainshtein, B. K.

Weinstein, E. E. *See* Vaĭnshteĭn, E. E.

Weinstein, L. A. *See* Vaĭnshteĭn, L. A.

Weinstock, B. *See* Abraham, B. M., 1805; Osborne, D. W., 5359

Weintroub, S. *See* Goss, A. J., 4894

Weir, C. E. High-pressure apparatus for compressibility studies and its application to measurements on leather and collagen, 5843. Compressibility of natural and synthetic high polymers at high pressures, 5844

Weir, R. E. *See* Corner, J., 2027

Weinzierl, P. M. *See* Ehrenhaft, F., 335

Weiser, H. B. *See also* Mulligan, W. O., 9741

Weiser, H. B. and Merrifield, P. The concept of critical zeta potential for hydrophobic sols. I, 1444

Weiss, J. Free radicals produced by ionizing radiations in an aqueous medium, 7351. Isotopic exchange between metal ions of different valency, 9042. *See also* Scholes, G., 1434

Weiss, M. T. and Strandberg, M. W. P. The microwave spectra of the deutero-ammonias, 4267, 7746

Weiss, P. R. *See* Sommers, H. S., Jr, 8837

Weiss, R. J. Small angle scattering of neutrons, 7298. *See also* McReynolds, A. W., 7297

Weiss, R. J., Hastings, J. and Corliss, L. Neutron crystal monochromators, 9006

Weisskopf, V. Nuclear models, 5654

Weisskopf, V. F. Radiative transition probabilities in nuclei, 9674

Weissler, A. Comment on "Theoretical explanation of the chemical effects of ultrasonics," 2468. Cavitation in ultrasonic depolymerization, 5190

Weissler, A. and Del Grosso, V. A. Ultrasonic investigation of liquids. VI. Acetylene derivatives, 118. The velocity of sound in sea water, 5180

Weissler, P. G. *See* Cook, R. K., 1823

Weissman, S. *See* Reis, A. J., 5913

Weissman, S. I. Polarization of the singlet-singlet and triplet-singlet luminescence of chelate compounds, 216

Weitbrecht, W. On the influence of nonlinear distortion on the audibility of mistuned musical intervals, 159

Weitz, M. and Keller, J. B. Reflection of water waves from floating ice in water of finite depths, 3373

Welch, H. W., Jr and Dow, W. G. Analysis of synchronous conditions in the cylindrical magnetron space charge, 4480

Welker, H. On the theory of galvanomagnetic effects for mixed conduction, 7872

Weller, A. *See* Kortüm, G., 1426, 3139

Weller, S. *See* Manes, M., 1395

Wellmann, P. The blue colour of the sun on September 27, 1950, 7418. On the spectrum of Nova EU Scuti 1949, 8474

Wells, A. A. Stress analysis in the motor industry, 100

Wells, A. F. Malachite: re-examination of crystal structure, 6587. *See also* Bailey, M., 5925

Wells, C. P. *See* Beth, R. A., 6045; Spence, R. D., 9614

Wells, E. J., Jr. *See* Dibeler, V. H., 2932

Wells, F. E. *See* Karlovitz, B., 5355

Wells, H. W. Rapid changes in the ionosphere, 5937. High-speed ionosheric recording technique, 5938. Characteristics of sporadic *E*, 6628

Wells, N. *See* Holden, A. V., 9891

Welsh, H. L. *See also* Crawford, M. F., 2538; Lauriston, A. C., 7757

Welsh, H. L., Pashler, P. E. and Dunn, A. F. Influence of foreign gases at high pressures on the infrared absorption band of methane at $3 \cdot 3\mu$, 4278

Welti, D. and Barrow, R. F. Ultra-violet absorption spectra of gallium and indium monofluorides, 9376

Welton, T. A. *See* Callen, H. B., 6759

Weniger, C. *See* Herman, R., 6114

Weniger, S. and Herman, R. Study of the emission spectrum of argon at high pressures, 5253. Excitation of some new permitted and forbidden lines of Al I in the ultraviolet, 7674

Went, J. J. Linear magnetostriction of homogeneous nickel alloys, 5623. The value of the spontaneous magnetization of binary nickel alloys as a function of temperature, 8848

Went, J. J. and Wijn, H. P. J. The magnetization process in ferrites, 5563

Wentink, T., Jr, Koski, W. S. and Cohen, V. W. The mass of S^{35} from microwave spectroscopy, 5677

Wentorf, R. H., Jr. *See also* Buehler, R. J., 4175

Wentorf, R. H., Jr, Buehler, R. J., Hirschfelder, J. C. and Curtiss, C. F. Lennard–Jones and Devonshire equation of state of compressed gases and liquids, 2648

Wentzel, G. μ-pair theories and the π-meson, 87. Nuclear saturation phenomena deducible from pair theories, 3326. The interaction of lattice vibrations with electrons in a metal, 7907

Wenzel, E. A. *See* Hagelbarger, D. W., 5683

Wergeland, H. *See* Olsen, H., 9539

Werner, A. C. Two calorimeters for industrial measurements, 4348

Werner, G. K., McNally, J. R., Jr and Johnson, P. C. Electronic computation of wave numbers, 8621

Werner, P. H. *See* Furrer, W., 4215

Wert, C. Diffusion coefficient of C in α-iron, 656. *See also* Dijkstra, L. J., 505; Radavich, J., 4791

Wert, C. A. Measurements on the diffusion of interstitial atoms in B.C.C. lattices, 2082

Wessel, S. On relativistic quantum mechanics and the mass operator, 8496

Wesson, L. G. Tables of electric dipole moments, 9442

West, D. *See also* Grace, M. A., 6439

West, D. and Dawson, J. K. Soft radiations from ^{239}Pu, 7240

West, G. D. Circulations occurring in acoustic phenomena, 6086

West, H. I., Jr. *See also* Hofstadter, R., 6481

West, H. I., Jr, Meyerhof, W. E. and Hofstadter, R. Detection of X-rays by means of NaI(Tl) scintillation counters, 3591

West, J. R. *See* Dalin, A., 1655

West, R. *See* Ehrenberg, W., 7021

West, S. S. Dependence of seismic wave velocity upon depth and lithology, 1523

West, W. and Carroll, B. H. Energy transfer in the photo-sensitization of silver halide photographic emulsions: Optical sensitization, supersensitization, and antisensitization, 4981

Westerdijk, J. B. *See* Kaan, J. F., 7660

Westervelt, P. J. Absorption of sound by gas bubbles at a water-metal interface, 5187. Acoustical impedance in terms of energy functions, 5197. The theory of steady forces caused by sound waves, 5210

Westfold, K. C. The interpretation of the magneto-ionic theory, 3662. *See also* Bolton, J. G., 796, 798; Jaeger, J. C., 2327

Westin, S. Investigations on the elastic scattering of slow electrons in helium, neon and argon, 9526

Westmeyer, H. *See* Fränz, H., 3776

Weston, E. B. *See* Dodson, H. W., 2335

Weston, G. F. Thermal conductivity of barium strontium oxide, 2600. *See also* Martin, S. L., 2492

Weston, R. McV. Photomicrography in colour by transmitted light, 8418

Westphal, W. Lens systems, 5235

Wetmore, F. E. W. *See* MacDonald, J. J., 9111

Wever, E. G. Some remarks on the modern status of auditory theory, 5954

Wexler, A. Recirculating apparatus for testing hygrometers, 3231

Wexler, A. and Corak, W. S. Superconductivity of vanadium, 320

Wexler, H. Annual and diurnal temperature variations in the upper atmosphere, 4933

Wexler, S. *See* Burson, S. B., 7219

Weygandt, C. N. *See* Cook, A. C., 3260, 5977

Weyl, H. 50 years of theory of relativity, 6015

Weyl, W. A. Light absorption as a result of an interaction of two states of valency of the same element, 9370. *See also* Shively, R. R., Jr, 9371

Weyssenhoff, J. Relativistically invariant homogeneous canonical formalism with higher derivatives, 7539

Whale, H. A. Fine structure of the ionospheric region *E*, 6635. Determination of electron densities in the ionosphere from experimental (h', f) curves, 6636

Whale, H. A. and Stanley, J. P. Group and phase velocities from the magneto-ionic theory, 2869

Whaling, W. *See also* Li, C. W., 6455, 8152

Whaling, W. and Li, C. W. Precise determination of the $Li^7(p, \alpha)He^4$ and $Be^9(d, \alpha)Li^7$ *Q*-value, 3764

Whalley, E. Application of thermal diffusion to gas analysis, 4882. Thermal diffusion in hydrogen water vapor mixtures, 5164. The effect of thermal diffusion on physico-chemical measurements, 8572

Wheatley, B. M. Radiotherapeutic physics. VII. An instrument for dosage estimation with fields of any size and shape, 9886

Wheatley, Q. de L. *See* Gilles, P. W., 4353

Wheeler, A. *See* Beeck, O., 1449

Wheeler, R. W. *See* Downs, D., 8282

Whinnery, J. R. The effect of input configuration on antenna impedance, 523. *See also* Taylor, T. T., 2859

Whipple, F. L. The theory of micro-meteorites. I. In an isothermal atmosphere, 3278*; II. In heterothermal atmospheres, 5019. A comet model. II. Physical relations for comets and meteors, 6685

White, A. *See* Hill, R. A. W., 3115

White, D. *See also* Friedman, A. S., 257, 4333; Johnston, H. L., 126

White, D., Friedman, A. S. and Johnston, H. L. The vapor pressure of normal hydrogen from the boiling point to the critical point, 256

White, D. F., Campbell, I. G. and Payne, P. R. Estimation of radioactive hydrogen (tritium), 1468

White, D. W. *See* Seybolt, A. U., 8354

White, G. K. Flow of liquid helium through fine channels, 6176. *See also* Bowers, R., 6177; Hercus, G. R., 2628; Mendelssohn, K., 1804

White, G. N., Jr and Drucker, D. C. Effective stress and effective strain in relation to stress theories of plasticity, 681

White, G. R. The penetration and diffusion of Co^{60} gamma-rays in water using spherical geometry, 1290

White, H. S. *See* McKee, S. A., 3870

White, J. E. A method for measuring source impedance and tube attenuation, 152. Some effects of vibration on X-ray diffraction by crystals, 4208

White, J. R. *See* Clark, O. H., 4141

White, M. G. *See* Lipkin, H. J., 374

White, R. M. The meridional eddy flux of energy, 9207. *See also* Starr, V. P., 9208

White, R. S. *See* Jones, S. B., 5742; Peterson, J. M., 5767

White, W. A. Measurements of secondary-electron emission from common phosphors, 7774

White, W. C. Positive-ion emission, a neglected phenomenon, 1898. Some experiments with Peltier effect, 8745

Whitehead, C. D. *See* Bacon, G. E., 2072

Whitehead, L. G. and Canetti, G. S. The laminar boundary layer on solids of revolution, 867

Whitehead, M. N. and Richman, C. On the angular distribution of π^+ mesons from 341-MeV protons on protons, 8962

Whitehead, W. D. Scattering of protons by carbon, 1118. The excitation functions for $B^{10}(d, \alpha)Be^8$, 6458. *See also* Swann, C. P., 612

Whitham, G. B. The propagation of spherical blast, 150

Whitman, C. I. *See* Vance, J. E., 6171

Whitmore, R. L. *See* Eveson, G. F., 2409; Ward, S. G., 865, 2408

Whittaker, D. *See* Fox, L. L., 895

Whittaker, E. J. W. An orthorhombic variety of chrysotile, 3937. *See also* Parker, R. C., 3828

Whittingham, G. Spectrum of the glow of burning carbon, 940

Whittle, E. *See* Warhurst, E., 7167

Whittmore, W. L. *See* Shutt, R. P., 4478

Whyte, G. N. Cosmic-ray bursts and the nucleonic cascade, 4507

Whyte, L. L. Planck's constant and the fine-structure constant, 2358

Whytlaw-Gray, R. *See* Casado, F. L., 6777

Wiblin, E. R. *See* Merrison, A. W., 4766

Wiborg, B. S. *See* Chackett, K. F., 9846

Wick, G. C. The evaluation of the collision matrix, 853. Detection of gamma-ray polarization by pair production, 4686. *See also* May, M., 4418

Wick, R. F. *See* Mason, W. P., 5200

Wickman, F. E. The crystal structure galenobismutite, $PbBi_2S_4$, 3934

Widell, F. G. and Hellar, R. A. Effect of coating composition of oxide-coated cathodes on electron emission, 405

Wideröe, R. Investigations on the capturing of electrons in a 30 MeV betatron, 4421

Widgoff, M. *See* Cocconi, G., 464

Wiebe, A. K., Gauvin, W. and Winkler, C. A. Hydrogen overvoltage and potential build-up at copper cathodes, 5862

Wieberdink, A. Determination of the complex propagation constant on a Lecher system, 7120

Wiedenbeck, M. L. *See* Beyster, J. R., 589; Frye, G. M., 7256

Wiedling, T. and Carlsson, A. Angular correlation of successive gamma-ray quanta in Cu^{65}, 7243

Wiegand, C. *See* Chamberlain, O., 8786

Wiegand, C. E. Distributed coincidence circuit, 4473. Measurement of the positive π-meson lifetime, 8994. *See also* Chamberlain, O., 4450; Leininger, R. F., 4634; Segrè, E., 4635

Wiegel, R. L. *See* Isaacs J. D., 3229

Wieland, J. *See* Busch, G., 1048, 3524, 7869

Wiener, N. Speech, language and learning, 2478

Wieninger, L. On the range of polonium α-rays in several alkali halide crystals (NaCl, KCl, KBr and KI), 8788. On the irradiation of natural coloured rocksalt crystals with α particles from RaF, 9408

Wieninger, L. and Adler, N. The formation of microcrystals on crystalline surfaces irradiated by Po-alpha-radiations, 739, 4895. On the irradiation of natural coloured rocksalt crystals with α-particles from RaF, 9407

Wiggins, A. M. *See* Beaverson, W. A., 157, 6087

Wight, K. C. A note on an automatic control for maintaining constant intensity of a light source, 8673

Wightman, A. S. *See* Marshak, R. E., 3041; Rau, R. R., 2791; Wolfe, B., 795

Wigner, E. P. On the statistical distribution of the widths and spacings of nuclear resonance levels, 8886

Wijn, H. P. J. *See* Went, J. J., 5563

Wilbur, D. A. *See* Cobine, J. D., 6239

Wilchinsky, Z. W. Effect of crystal, grain and particle size on X-ray power diffracted from powders, 2169

Wilcox, F. W. *See* Curry, B., 6088

Wild, E. On Boltzmann's equation in the kinetic theory of gases, 9337

Wild, J. P. Observations of the spectrum of high-intensity solar radiation at metre wavelengths. II. Outbursts, 2329; III. Isolated bursts, 5024; IV. Enhanced radiation, 5025. Automatic focusing condition for double-crystal spectrometer, 8347

Wild, J. P. and McCready, L. L. Observations of the spectrum of high-intensity solar radiation at metre wavelengths. I. The apparatus and spectral types of solar burst observed, 2328

Wild, R. L. The small-angle scattering of X-rays by nitrogen, 2723

Wild, W. *See* Holiday, E. R., 8741

Wildermuth, K. A theory of elementary particles using differential equations, 70

Wildhack, W. A. *See* Perls, T. A., 7642

Wilets, L. *See also* Shenstone, A. G., 6842

Wilets, L. and Bradley, L. C., iii. The effect of electron-neutron interaction on spectral isotope shifts, 5104

Wilhelmi, K.-A. *See* Byström, A., 3933

Wilkes, M. V. The thermal excitation of atmospheric oscillations, 7411

Wilkins, J. J. *See also* Goward, F. K., 1093, 1305, 3024–5, 3770

Wilkins, J. J. and Goward, F. K. Ground state ^8Be nuclei in photo-disintegration stars, 1306. Fall and re-increase of the $^{12}C(\gamma, 3\ ^4He)$ cross section, 3774

Wilkins, M. H. F. Some aspects of microspectrography, 7661. *See also* Norris, K. P., 4318, 7796

Wilkinson, D. H. *See also* Carver, J. H., 3005, 3775; Jones, G. A., 9686

Wilkinson, D. H. and Carver, J. H. The mass of Cl^{39}, 8908. Photoprotons from argon under the action of gamma-rays of 17·6 MeV, 8975

Wilkinson, G. A note on 11·5-day Tl^{202}, 1271. Neutron deficient radioactive isotopes of tantalum and wolfram, 2002

Wilkinson, G. and Hicks, H. G. Radioactive isotopes of the rare earths. III. Terbium and holmium isotopes, 568. A note on neutron-deficient europium activities, 2001. Radioactive isotopes of lutetium and hafnium, 4650

Wilkinson, K. R. *See also* Hull, R. A., 5364

Wilkinson, K. R. and Wilks, J. The thermal conductivity of solid helium, 2634

Wilkinson, P. G. The properties of evaporated gold and tungsten oxides, 3070. Lattice distortion spectrum of evaporated gold, 4783

Wilkinson, R. G. *See* Israel, H. I., 9656; Miller, M. M., 7217, 9675

Wilks, J. *See* Berman, R., 9416; Hull, R. A., 5364; Ward, J. C., 3497; Wilkinson, K. R., 2634

Willard, G. W. Improved methods for measuring ultrasonic velocity, 4182

Willard, H. B. and Preston, W. M. The first excited state of Be^7 from the $Li^7(p, n)Be^7$ reaction, 4703

Willard, J. E. *See* Goldhaber, S., 8305

Willems, J. On oriented growth of crystals of organic compounds, 7378

Willett, H. C. Temperature trends of the past century, 4934

Williams, A. O., Jr. The piston source at high frequencies, 4198*. On the absorption of high power sound waves in water, 5186. *See also* Carter, A. H., 5194; Keck, W., 5199

Williams, A. O., Jr and Keck, W. Effects of reflected signals and electric pick-up at an ultrasonic microphone, 5213

Williams, D. Determination of nuclear magnetic moments by super-regenerative techniques, 7183. The nuclear magnetic moment of praseodymium, 8133. *See also* Bak, B., 950; Rogers, J. D., 6870; Sheriff, R. E., 7185; Van Asselt, R., 954; Yu Ting, 5579

Williams, D. R. *See* Barbier, D., 2223

Williams, D. T. *See* Czyzak, S. J., 9436

Williams, D. V. P. *See* Smith, D. F., 958

Williams, E. A. *See* Isaacs, J. D., 5151

Williams, F. C., Kilburn, T. and Tootill, G. C. Universal high-speed digital computers: a small-scale experimental machine, 2301

Williams, F. C., Robinson, A. A. and Kilburn, T. Universal high-speed digital computers: serial computing circuits, 7450

Williams, F. E. Calculation of the absorption and emission spectra of the thallium-activated potassium chloride phosphor, 1754. An absolute theory of solid-state luminescence, 4293. Theoretical low temperature spectra of the thallium activated potassium chloride phosphor, 5306. *See also* Johnson, P. D., 2555, 3451; Roberts, S., 211

Williams, G. W. *See* Morrish, A. H., 2498
Williams, H. J. Ferromagnetic domains, 501. *See also* Nesbitt, E. A., 1188
Williams, H. J., Foster, F. G. and Wood, E. A. Observation of magnetic domains by the Kerr effect, 7137
Williams, H. J., Shockley, W. and Kittel, C. Studies of the propagation of a ferromagnetic domain boundary, 2824
Williams, H. J. and Walker, J. G. Domain patterns on nickel, 8043
Williams, H. T. *See* Bowden, F. P., 8285
Williams, J. H. *See* Allred, J. C., 4988; Lampi, E. E., 3030
Williams, L. B. *See* Masket, A. V., 5731
Williams, R. J. P. *See* Hume-Rothery, W., 9092
Williams, R. L. *See* Boyd, D. R. J., 7166, 7704; Thompson, H. W., 7750
Williams, R. W. *See* Snyder, T. M., 3786
Williams, V. Z. Principles of infrared spectrophotometry, 3429
Williams, W. E. *See* Greenough, M. L., 3356
Williams, W. E., Jr. *See* Greenough, M. L., 8295
Williamson, E. M. *See* Flint, H. T., 6734
Williamson, R. M. *See* Browne, C. P., 7262
Williamson, I. Viscosity—temperature dependence, 4138
Williamson, L. *See* Mohler, F. L., 2155
Williamson, M. B. *See* McDonald, H. J., 9105
Williamson, R. E. *See* Seeger, C. L., 3291
Williamson, R. M. *See* Goldhaber, G., 5748
Willis, H. A. *See* Cross, L. H., 7707
Willis, J. B. The influence of slit-width on the shape and intensity of infra-red absorption bands, 8618
Willmore, P. L. The theory and design of two types of portable seismograph, 3953
Willms, W. Measurement of acoustic resistances. I. Definitions and methods of measurement, 1687; II. Methods of measurement, 4214
Willott, W. H. The hardness of glass, 1381
Willsher, J. P. *See* Cullis, C. F., 9761
Wilman, H. The slip, twinning, cohesion, growth and boundaries of crystals, 5902. *See also* Evans, D. M., 3190
Wilmore, P. L. Crustal layers of the Earth, 9841
Wilms, G. R. *See* Wood, W. A., 5839
Wilsdorf, H. X-ray optics with crystal reflection, 9133
Wilsdorf, H. G. F. and Haul, R. A. W. X-ray study of the thermal decomposition of dolomite, 7391
Wilsey, R. B. The use of photographic films for monitoring stray X-rays and gamma-rays, 5957
Wilson, A. J. C. Geiger-counter X-ray spectrometer—influence of size and absorption coefficent of specimen on position and shape of powder diffraction maxima, 2168. Variance of X-ray intensities, 5915
Wilson, A. R. W., Keam, D. W. and Dunbar, D. N. F. The angular distribution of the neutron from the *d-d* reaction, 3767
Wilson, B. A. *See* Kuhn, H., 229
Wilson, B. W. An interference method for the measurement of microscopic spheres, 4126
Wilson, C. W. Radiocobalt (Co^{60}) as a therapeutic alternative to radium, 7435. Radiotherapeutic physics. IV. Some developments of the physical aspects of teleradium therapy, 9883
Wilson, D. V. Relation of changes in the cementite Curie temperature to textural changes in steel, 7104
Wilson, E. *See* Mihelich, J. W., 7204
Wilson, E. B., Jr. Determination of molecular structure with microwave spectroscopy, 7744
Wilson, E. J., Jr. *See* Barr, W. J., 4811
Wilson, G. W. *See* Bates, L. F., 8044
Wilson, H. W. Radioactivity of Ni^{57} and Ni^{63}, 1273. Radioactivity of nickel, 6417
Wilson, H. W. and Curran, S. C. The radiations of ^{203}Hg as observed by a new method, 8157
Wilson, I. B. *See* La Mer, V. K., 2139
Wilson, J. G. On the relative numbers of positive and negative μ-mesons at sea level, 475. *See also* Hyams, B. D., 439; Mylroi, M. G., 5518; Owen, B. G., 5519
Wilson, J. H. and Bolam, T. R. Chemisorbed oxygen on charcoal and the sorption of strong inorganic bases and acids, 4859
Wilson, J. T. *See* Collins, C. B., 7400
Wilson, L. H., Sibbitt, W. L. and Jakob, M. Flow of gases in porous media, 7604
Wilson, R. Cross-over transitions in Ir^{194}, Ag^{110}, Cs^{134}, 1268. Neutron capture γ-rays from Cd, Cl, and C, 1315. *See also* Bishop, R. G., 1307, 3773, 4723; Clark, D. L., 8224; Mims, W., 2028; Woodhead, D. W., 6525
Wilson, R., Beghian, L., Collie, C. H., Halban, H. and Bishop, G. R. High pressure ionization chamber counters and their use, 388
Wilson, R. R. The range and straggling of high energy electrons, 9528. *See also* Bethe, H. A., 8229; Camac, M., 6449
Wilson, T. *See* Boag, J. W., 7031
Winand, L. *See* Morand, M., 1168
Winch, G. T., Harrison, W. and Ruff, H. R. Fluorescent lamp artificial daylight units for colour matching, 1782
Winch, G. T. and Ruff, H. R. Measurement, representation and specification of colour and colour rendering properties of light sources, 1790
Winch, G. T. and Young, B. M. Colour and lighting, 6157
Winckler, J. R., Stix, T., Dwight, K. and Sabin, R. A directional and latitude survey of cosmic rays at high altitudes, 451
Windle, J. J. *See* Shaw, T. M., 285, 8641
Winegard, W. C. *See* Stewart, M. T., 8240
Winhold, E. J. *See* Langstroth, G. O., 2611
Winkler, C. A. *See* Roxburgh, J. M., 695; Turner, R. C., 7365; Wiebe, A. K., 5862
Winkler, E. H. Principle and design of a new type Stieltjes integrator, 6676
Winkler, E. M. Density measurements in supersonic flow by means of the X-ray absorption method, 2450
Winn, E. B. The temperature dependence of the self-diffusion coefficients of argon, neon, nitrogen, oxygen, carbon dioxide, and methane, 2455
Winn, M. M. An apparatus for the production of pure deuterium from heavy water, 5682
Winsberg, L. *See* Krueger, H. H. A., 2070
Winsche. W. E. *See also* Rosen, J. B., 2426
Winsche, W. E., Strang, L. G., Jr and Tucker, W. D. Production of iodine-132, 7282
Winslow, G. H. *See* Huizenga, J. R., 1277
Winston, H. The electronic energy levels of molecular crystals, 4902
Winter, E. R. S. The use of ^{18}O in studies of the reactivity of solid oxides, 1398. Diffusion properties of gases. IV. The self-diffusion coefficients of nitrogen, oxygen and carbon dioxide, 8568
Winter, J. Several consequences of the motion of swarms in liquids, 5157
Winter, R. G. Double beta-decay as a first-order process, 9669
Winteringham, F. P. W. Half-life of bromine-82, 2958. Radiochemical techniques in analysis (conf. rep.), 9116
Winter-Klein, A. Fluctuations in the change of refractive index of glasses as a function of temperature, 4231. The molecular refractivity of glasses, 9100
Winter-Klein, A. and Naudin, F. The relation between thermal transformation of glass and internal stress, 269
Wintner, A. *See* Hartman, P., 3923
Winzler, R. J. *See* Berman, D. A., 9114
Wirths, G. *See* Riehl, N., 9318
Wirtz, K. *See* Gierer, A., 146, 3383; Schrader, R., 7585
Wise, H. and Altman, D. The measurement of chemical equilibria by means of the critical flow orifice, 5847
Wise, J. H. and Elmer, J. T. The infra-red spectrum of nitrosyl chloride, 1742
Wish, L. *See* Bizzell, O. M., 7225
Wiskott, D. *See* Marschall, H., 8164
Witt, H. Electron current impulses in NaCl-crystals released by α-particles, 1126
Wittborg, W. *See* Kalb, G., 7372
Witte, H., Klee, H. and Lieser, K. H. The influence of Brillouin zones on the physico-chemical properties of alloys, 8040
Witte, R. S. and Anthony, R. L. Stress-temperature studies of transitions in rubbers, 6507

Witty, R. and Wood, P. A micro-focus X-ray tube, 2722

Wlérick, G. Rectifier effect of thin semiconductive layers that are illuminated asymmetrically, 7874

Woehl, W. Optical techniques and apparatus for the quantitive measurement of variations in density. I–II, 3470; III–IV, 3471

Wohlfarth, E. P. Collective electron ferromagnetism: rectangular energy bands, 5555

Woldringh, J. S. A survey of recent work in Holland, 2722

Wolf, E. Light distribution near focus in an error-free diffraction image, 1773. The diffraction theory of aberrations, 7659. *See also* Zigler, M. J., 5949

Wolf, E. and Zigler, M. J. Dark adaptation level and duration of test flash, 4963

Wolf, F. *See* Kumm, A., 9861

Wolf, I. Studies on the relations between the spectral sensitivity on selenium photoelements and the photocurrent and load resistance, 1060

Wolf, R. *See* Gallais, F., 3689

Wolfe, B., Routly, P. McR., Wightman, A. S. and Spitzer, L., Jr. The acceleration of dust grains by supernovae, 795

Wolfenstein, L. Conservation of angular momentum in the statistical theory of nuclear reactions, 5729

Wolff, D. *See* Stranski, I. N., 3489

Wolff, H. S. *See* Walsh, E. G., 6094

Wolff, P. A. Production of μ-mesons by gamma-rays, 6472

Wolfgang, R. L. *See* Grosse, A. V., 6396

Wolfhard, H. G. *See also* Gaydon, A. G., 2619, 5254, 7671

Wolfhard, H. G. and Parker, W. G. Influence of sulphur on carbon formation in diffusion flames, 260

Wolfson, J. L. Source discharger for magnetic lens beta-ray spectrometers, 5462

Wolicki, E. J., Waldman, B. and Miller, W. C. The nuclear excitation of Ag^{107} and Ag^{109} by X-rays, 5779

Wolkenstein, F. F. *See* Volkenshtein, F. F.

Wolkenstein, M. V. *See* Volkenshtein, M. V.

Wolkers, G. J. *See* Michels, A., 8574

Wollan, E. O. *See also* Shull, C. G., 4737, 5568, 7072

Wollan, E. O., Shull, C. G. and Koehler, W. C. Neutron-deuteron scattering amplitudes, 8236

Wolter, H. The "minimum ray-concept" as a means of increasing the accuracy of optical measurements and as a methodical help in replacing the concept of a ray, 232. The physical foundation of a colour circle and propositions of a physical theory of colour, 997. Two dimensional coloured Schlieren apparatus, 1003. Phase contrast systems in colour, 2594. The rendering of amplitude, phase and polarization objects into a single, coloured image, 8670. Interference apparatus for the conversion of a microscope into an interference microscope, 8671

Woltz, P. J. H. *See* Jones, E. A., 2536, 4251, 4283

Wong, E. L. *See* Gerstein, M., 3493

Wood, C. E. and Tittle, C. W. Electrolysis of aluminium solutions in a magnetic field, 3145

Wood, D. L. An infra-red microspectrometer for biological research, 179

Wood, D. L., Bell, E. E. and Nielsen, H. A. Infra-red bands in the spectrum of NH$_3$, 205

Wood, E. A. Evidence for the noncubic high temperature phase of BaTiO$_3$, 8334. Polymorphism in potassium niobate, sodium niobate, and other ABO_3 compounds, 9123. *See also* Williams, H. J., 7137; Yager, W. A., 1929

Wood, G. B. *See* Kurbatov, M. H., 5884

Wood, J. E. *See* Tebble, R. S., 9595

Wood, J. K. *See* Foreman, A. J., 3091

Wood, M. *See* Way, K., 6402

Wood, P. *See* Witty, R., 2722

Wood, R. E. *See* Ritter, H. L., 3203

Wood, W. A. Intrinsic crystalline structure and the strength of metals, 3676

Wood, W. A. and Head, A. K. Some new observations on the mechanism of fatigue in metals, 5834

Wood, W. A., Wilms, G. R. and Rachinger, W. A. Three basic stages in the mechanism of deformation of metals at different temperatures and strain-rates, 5839

Woodford, D. E. *See* Field, J. E., 949

Woodgate, G. K. *See* Kuhn, H., 1980

Woodger, M. Automatic computing engine of the National Physical Laboratory, 4037

Woodhead, D. W. and Wilson, R. Fading of detonation in cones of explosive, 6525

Woodhull, J. C. *See* May, A., 871

Woodrow, C. C., Carmack, M. and Miller, J. G. The dipole moments and structures of a series of alkyl polysulfides, 7171

Woodruff, S. A. *See* Garrett, A. B., 9321

Woods, W. W. *See* Clark, O. H., 4141

Woodward, I. *See* McKeown, P. J. A., 8685; Menary, J. W., 8356

Woodward, L. A. and George, J. H. B. Refractive index correction in relative Raman intensity measurements, 2570. Light flux received by a spectrograph from a spatially extended refracting source, 9364

Woodward, P. M. Time and frequency uncertainty in waveform analysis, 8434

Woodward, W. M. *See* Benedict, T. S., 9707; Camac, M., 6449

Woolf, W. E. *See* Burgy, M., 3054; Hughes, D. J., 2069

Woolfson, M. M. A photoelectric structure-factor machine, 6576

Woolley, R. H. *See* McLachlan, D., Jr, 7389

Woolley, R. L. An alpha particle counter for students' experiments, 3586

Woolley, R. v. d. R. and Allen, C. W. Ultra-violet emission from the chromosphere, 3280

Woolley, R. v. d. R. and Gottlieb, K. Monochromatic magnitudes observed with a coarse grating, 2338

Woonton, C. A., Carruthers, J. A., Elliott, H. A. and Rigby, E. C. Diffraction errors in an optical measurement at radio wavelengths, 4550

Wooster, N. *See* Brown, C. S., 7375

Wooster, W. A. *See* Brown, C. S., 7375; Prince, E., 3820; Ramachandran, G. N., 9131–2; Thomas, L. A., 8335

Wooters, G. Lens centering in microscope objectives, 246

Work, R. N. *See* Quinn, F. A., Jr, 7807

Wormell, T. W. *See* Goody, R. M., 9386

Worner, H. W. Thermoelectric properties of titanium with special reference to the allotropic transformation, 5427

Worsfold, D. J. *See* Jones, B., 7341

Worsnop, R. *See* Tait, J. F., 2265

Wouters, L. *See* Fox, R., 1329

Wrenn, F. R., Jr, Good, M. L. and Handler, P. The use of positron-emitting radioisotopes for the localisation of brain tumors, 7437

Wright, B. A. *See* Perron, R. R., 2132

Wright, B. T. *See* Burking, J. W., 6267; Faris, F. E., 382

Wright, G. F. *See* Brook, A. G., 2188

Wright, G. J. *See* Davidson, H. R., 2550

Wright, M. L. Preparation of uniform solid samples for radioactive assay, 9651

Wright, N. *See* Young, C. W., 7737

Wright, R. W. The variation with temperature of the electrical properties of a degenerate electronic semiconductor as exemplified by cadmium oxide, 5407. *See also* Miller, R. D., 4702; Rado, G. T., 1178

Wright, S. C. Li^8 splinters from nuclear bombardments, 607. *See also* Marshall, L., 7274

Wright, W. D. The role of convergence in stereoscopic vision, 5950. Modern problems of colorimetry, 9406

Wright, W. E. and Deutsch, M. Further search for nuclear transitions with lifetimes between 3×10^{-9} sec and 10^{-7} sec, 5695

Wrightson, F. M. and Fankuchen, I. A monochromator for X-ray powder camera, 4414

Wrinch, D. Vector maps of hydrated protein crystals, 1497. A note on the diffraction patterns of crystalline proteins, 2185

Wrubel, M. H. Turbulence and the curve of growth, 2352

Wu, C. S. Recent investigation of the shapes of β-ray spectra, 2976

Wu, C. S. and Feldman, L. Beta-spectrum of Cl^{36}, 6428

Wu, S.-S. A remark on the conventional perturbation theory, 7560

Wu, T.-Y. Further remarks on Araki's theory of inverted alkali doublets, 2507
Wu, T.-Y. and Ourom, L. Probability of auto-ionization in light atoms, 1252
Wucher, J. *See* Foëx, G., 8025
Wulf, O. R. and Nicholson, S. B. Solar flares and moderate geomagnetic activity, 1582
Wulff, V. J. *See* Fry, W. J., 1684, 5189
Wulfsberg, K. N. A tuning fork filter, 1682
Wüster, H. O. *See* Försterling, K., 1204, 4555
Wyatt, O. H. Transient creep in pure metals, 7327
Wyatt, P. A. H. An empirical extension of Onsager's conductivity equation, 9060
Wyckoff, H. O. *See* Goldstein, N., 4420
Wyk, A. J. A. van der. *See* van der Wyk, A. J. A.
Wyk, C. B. van. *See* van Wyk, C. B.
Wyllie, G. *See* Benson, G. C., 3681; Huang, K., 1409
Wyman, M. Unified field theory, 4072
Wynne, C. G. A new form of $f\,0{\cdot}71$ lens for 35 mm cine-radiography, 6667
Wynne-Jones, W. F. K. *See* Lal, H., 3865
Wyon, G. *See* Crussard, C., 7439

Yabsley, D. E. Atmospheric noise levels at radio frequencies near Darwin, Australia, 3240. *See also* Christiansen, W. N., 803, 5026; Lehany, F. J., 809
Yachter, M. *See* Ansoff, H. I., 6051
Yaffe, L., Hawkins, R. C., Merritt, W. F. and Craven, J. H. The thermal neutron capture cross section of Co^{59}, 6468
Yaffe, L. and Stevens, W. H. The reaction C^{14}(n, γ)C^{15}, 625. An attempt to detect the reaction C^{14}(n, γ)C^{15}, 8202
Yager, W. A. *See also* Galt, J. K., 4520
Yager, W. A., Galt, J. K., Merritt, F. R. and Wood, E. A. Ferromagnetic resonance in nickel ferrite, 1929
Yager, W. A., Merritt, F. R. and Guilland, C. Ferromagnetic resonance in various ferrites, 4521
Yagoda, H. Cascade processes recorded in an emulsion chamber exposed in the stratosphere, 2805. *See also* Shapiro, M. M., 1918
Yakimac, A. *See* Antonoff, G., 1648
Yakovlev, V. A. *See* Vlasov, A. A., 7383
Yakovleva, E. S. and Yakutovich, M. V. Influence of twinning on the brittle failure of zinc crystals, 2108
Yakutovich, M. V. *See* Pavlov, V. A., 6487*; Yakovleva, E. S., 2108
Yamabe, S. *See* Oda, Y., 2068, 6034, 9001; Sanada, J., 3008
Yamabe, S. and Sanada, J. Neutron cross section and nuclear shell structure, 5780
Yamada, E. *See also* Ogawa, S., 642, 5724, 7547
Yamada, E., Nagahara, Y. and Ogawa, S. On the absorption of negative π-meson by proton. II, 8219
Yamada, S. Researches on dichroism of planar complexes. I, 5290; II. The color and the structure of [Pt(NH$_3$)$_4$] [PtCl$_4$] and [Pt(NH$_3$)$_4$] [PtBr$_4$], 5291
Yamagata, Y. *See* Kanda, T., 9643
Yamaguchi, J. and Katayama, S. X-ray analysis on selenium layers of selenium rectifiers, 1834. On cadium selenide of selenium rectifiers, 1835
Yamaguchi, S. Oriented crystals in the rolled plates of alloys, 5814. On the etched surfaces of nickel single crystals, 8341. The diffraction, by benzene vapour, of electron beams accelerated through 200 kV, 8771
Yamaguchi, Y. Order of magnitude theory of the depression of Coulomb barrier height in highly excited nuclei, 542. On the nuclear stars, 5730. On the stars of light nuclei, 5736. Remarks on the production of cosmic-ray mesons, 8011. *See also* Aidzu, K., 5120; Fujimoto, Y., 636, 5118, 5537–8, 7545; Horie, H., 8115; Takayanagi, K., 5690; Taketani, M., 6389
Yamaka, E. A study of oxide-coated cathode by X-ray diffraction method, 8808
Yamakawa, K. A. Silver bromide crystal counters, 5495
Yamamoto, D. and Iwaki, R. Relations between dye phosphors and hydrogen bonds of rigid media or surface of adsorbents, 5893
Yamamoto, G. On nocturnal radiation. I. Theoretical consideration, 9220
Yamamoto, H. *See* Sato, H., 5567
Yamamoto, K. *See* Horio, M., 7316
Yamamoto, M. *See also* Suzuki, T., 4794
Yamamoto, M. and Iwata, T. Magnetic domain patterns on nickel crystals, 4536
Yamamoto, M. and Watanabe, J. Light figures of zinc crystals, 4889. Orientation determination of zinc crystals by the light-figure method, 4890
Yamamura, H. *See* Fujisaki, Y., 1014
Yamanaka, C. and Suita, T. Current noise and dielectric breakdown in alkali halide crystals, 8759
Yamanouchi, T. Probabilities of excitation and de-excitation of metastable states of oxygen atom by collision of slow electron, 1137
Yamasaki, K., Kotera, A., Yokoi, M. and Ueda, Y. An electron diffraction study of structures of tetramethylorthosilicate, hexamethyldisiloxane and hexachlorodisiloxane, 2085
Yang, C. N. and Feldman, D. The S-matrix in the Heisenberg representation, 94
Yang, L. M. Nuclear shell structure and nuclear density, 8119. *See also* Born, M., 543
Yang, T.-Y. Transformation of water from covalent to electrovalent combination in formic acid-water mixtures, 5885
Yankovskaya, L. V. Basic physical processes in brake contact, 1631
Yanus, R. I. *See* Drozhzhina, V. I., 2817; Goldman, A. L., 1926
Yao, T. P. and Kondic, V. Viscosity of metallic liquids, 107
Yarwood, J. *See also* Le Croissette, D. H., 7964
Yarwood, J. and Le Croissette, D. H. Vapour pressure measurements of bromine, 4337
Yasaitis, E. *See also* Smaller, B., 4614
Yasaitis, E. and Smaller, B. Nuclear magnetic moment of Rb^{85}, Rb^{87}, and I^{127}, 6390
Yasaki, T. and Miyatake, O. A note on asymmetric fission, 624. On the probability of asymmetric and symmetric fission, 2921
Yasin, M., Ahmed, R. and Gill, P. S. An external cathode hard-glass Geiger–Müller tube, 6278. An externally coated Pyrex G–M counter, 9541
Yasumi, M., Okabayashi, H., Shirai, M. and Mizushima, S. Dielectric constant and loss factor of ethyl alcohol and water at $\lambda = 3{\cdot}24$ cm obtained by free wave method, 6953
Yasumi, S. *See* Arakatsu, B., 6461
Yates, J. G. *See also* Sander, K. F., 9524
Yates, J. G., Lucas, D. H. and Johnson, D. L. Multichannel measurement of physical effects by confluent pulse technique with particular reference to the analysis of strain, 861, 4127
Yates, R. J. The theory and measurement of noise factor, 303
Yathira Iyengar, B. R. *See under* Yatiradzha Iengar, B. R.
Yatiradzha Iengar, B. R. *See* Kulkarni Dzhatkar, S. K., 6197, 6199
Yatseev, V. L. One class of exact solutions of the equations of motion of a viscous liquid, 7588
Yavorskiĭ, B. M. *See also* Biberman, L. M., 371
Yeager, E., Bugosh, J. and Hovorka, F. The measurement of ultrasonic vibration potentials (Debye effect) with pulse technique, 2476
Yeager, E. and Hovorka, F. The effect of acoustical radiations on the hydrogen electrode, 3144
Yeagley, H. L. A preliminary study of a physical basis of bird navigation. II, 6656
Yeater, M. L. *See* Gaerttner, E. R., 5773, 7271
Yeh, C. and Chaffee, E. L. High frequency impedance of low pressure gaseous diodes, 383
Yeniçay, F. E. The 800-kV neutron generator of the University of Istanbul, 6480
Yennie, D. R. Some remarks on non-local field theory, 2385
Yeo, D. *See* Gunn, D. L., 9193; Kendall, J. T., 3637
Yerg, D. *See* Sherrod, J., 2197
Yoder, H. S., Jr. High-low quartz diversion up to 10 000 bars, 3491
Yoder, P. R., Jr. *See* Rank, D. H., 242
Yoffe, A. D. Thermal decomposition and explosion of azides, 8286
Yoffe, E. H. The moving Griffith crack, 8274
Yokobori, T. Fatigue fracture of steel, 5836. Delayed fracture in creep of copper, 5837
Yokoi, M. *See* Yamasaki, K., 2085

Yokota. R. On the structure of NaO_2–SiO_2 glasses, 2076

Yonezawa, T. On the reflection of radio waves from a meteor, 5988. On the variation of electron and ion densities in the F_2-Layer at the time of the solar eclipse on February 5, 1943, 6626

York, H. *See* Hadley, J., 2050

York, J. L. *See* Geist, J. M., 9077

Yoshida, S. *See* Horie, H., 8115; Sekido, Y., 8446

Yoshii, G. On fast neutron in cosmic rays, 1901

Yoshizawa, Y. *See* Sanada, J., 8892

Yosida, K. Note on the magnetic resonance absorption in paramagnetic salts, 5573

Yost, D. M. *See* Douglas, D. L., 1922, 3148; Goeddel, W. V., 6345; Shoolery, J. N., 5644; Wayne, L. G., 4829

Young, A. H. *See* Studer, F. E., 7765

Young, A. S. *See* Chasmar, R. P., 6910

Young, C. H. Development work on a brittle lacquer suitable for experimental stress analysis, 100

Young, C. W., Duvall, R. B. and Wright, N. Characterization of benzene ring substitution by infrared spectra, 7737

Young, D. M. *See* Tompkins, F. C., 3872–3; Winch, G. T., 6157

Young, D. R. Temporary enhancement of hysteresis in barium titanate samples, 4367. Electric breakdown in CO_2 from low pressures to the liquid state, 8747

Young, F. W., Jr. *See* Cleland, J. W., 6969

Young, J. E. *See* Bowden, F. P., 8278, 9038

Young, J. M. *See* Hatfield, T. N., 1141

Young, J. N., Pool, M. L. and Kundu, D. N. Radioactive I^{122}, 9655

Young, J. Z. and Roberts, F. A flying-spot microscope, 3473

Young, M. *See* Ruze, J., 3659

Young, R. S. *See* Clayton, H. R., 5209

Young, T. F. *See* Rice, B., 7771

Younkin, S. G. Measurement of small color differences in tomato purees, 1002

Youse, E. *See* Ungnade, H. E., 6861

Yousef, Y. L. and Kamel, R. Relaxation spectrum of glass, 6804

Yousef, Y. L., Mikhail, H. and Girgis, R. K. Proposed dynamic method for magnetic measurements in small fields, 7059

Youtz, B. *See* Richman, C., 3043

Yovits, M. C. *See* Breit, G., 4093

Ythier, C. *See* Flammersfeld, A., 576

Yu, F. C. *See* Alder, F., 5666, 5669; Proctor, W. G., 2924

Yu, T.-Y. *See* Moses, H. E., 7404

Yu Ting and Williams, D. Microwave resonance absorption in paramagnetic salts, 5579

Yuan, L. C. L. Distribution of slow neutrons in free atmosphere up to 100 000 feet, 3605. *See also* Falk, C. E., 7036

Yuasa, T. On an anomaly concerning the scattering of β-rays in matter. I, 6261

Yuasa, T. and Radvanyi, P. On an anomaly concerning the scattering of β-rays in matter. II, 6261

Yudalevich, F. F. Construction of a theory of crepuscular phenomena from study of the secondary dispersion, 3236

Yudowich, K. L. Latex particle size from X-ray diffraction peaks, 3076

Yukawa, H. Quantum theory of non-local fields. II. Irreducible fields and their interaction, 2367. On the difference between local and non-local fields, 7512

Yukawa, J. and Umezawa, H. On the problem of covariance in quantum electrodynamics. I, 7520; II, 8505

Yurov, S. G. Spectral sensitivity of the eye for a given level of equivalent brightness, 2249

Yuster, P. *See* Casler, R., 2522; Delbecq, C. J., 5272

Yustova, E. N. Spectra sensitivity of the receiving organs of the eye, 2248

Yvon, J. Calculation of the critical state of a cylindrical pile provided with a reflector, 8212. *See also* Raievski, V., 623

Zablocki, H. S. *See* Rosenthal, L. A., 1196

Zachariasen, W. H. Crystal chemical studies of the 5*f*-series of elements. XIV. Oxyfluorides, *XOF*, 6589

Zadeh, L. A. Circuit analysis of linear varying-parameter networks, 515. On stability of linear varying-parameter systems, 4031. Initial conditions in linear varying-parameter systems, 5974. A note on the initial excitation of linear systems, 9226

Zaffarano, D. J. *See* Jensen, E. N. 2943

Zagyanskiĭ, I. L., Samsonov, G. V. and Popova, N. V. The problem of obtaining single crystals of boron carbide, 3192

Zaheer, S. H. *See* Sanghi, I., 2128

Zakharova, V. P. *See* Zatespin, G. T., 2785

Zandberg, E. Ya. *See* Dukelskiĭ, V. M., 8806

Zandman, F. Some aspects of the properties of methyl methacrylate, 3823. Analogy between the rupture of methyl methacrylate and that of metals by fatigue, 8276

Zanotelli, G. Behaviour of a sound wave when passing through a cloud layer, 2215

Zanstra, H. The value of observations of continuous spectra in the chromosphere and prominences, 813. An attempt to explain the polarization in Hα and D_3 for prominences, 5032

Zapffe, C. A. and Landgraf, F. K. Tearline patterns in ferrochromium, 686

Zappa, L. Hydrodynamical problems relating to masses of cosmic dimensions, 794

Zar, J. L. Expansion valve for triggered cloud chambers, 1889. Zenith angle and momentum spectrum of μ-mesons at sea level, 8002

Zaretti, L. Notes on an application of the electro-osmotic process to consolidating clay soils, 2708

Zatsepin, G. T. *See also* Skobeltsyn, D. V., 2784

Zatsepin, G. T., Rozental, I. L. and Slavatinskiĭ, S. A. The altitude variation of the penetrating component of broad atmospheric showers of cosmic rays, 437

Zatespin, G. T., Rozental, I. L., Zakharova, V. P., Khrebet, N. G. and Khristiansen, G. B. Observations of atmospheric showers of cosmic radiation of more than 1 000 m widths, 2785

Zatzkis, H. Conservation laws in the general theory of relativity with electromagnetic field, 5066. *See also* Bergmann, P. G., 847

Zavaritskiĭ, N. V. Thermal resistance of metal surfaces in contact at He temperatures, 8677

Zawadzki, J. The mechanism of ammonia oxidation and certain analogous reactions, 1397

Zdhanov, G. *See* Abdullaev, A., 5547

Zeeman, P. B. Spectrum of the boron monosulfide (BS) molecule, 2517. Rotational analysis of the γ band system of the NS molecule, 7684. Spectrum and structure of the boron monosulphide (BS) molecule, 8625

Zehden, W. Density control in the manufacture of rhodium filters, 4782

Zehender, E. Electron microscopic investigation of the structure of evaporated Zn and Cd layers, 3810

Zeldes, H. *See also* Brosi, A. R., 586; Ketelle, B. H., 2000

Zeldes, H., Brosi, A. R. and Ketelle, B. H. Low intensity radiations in I^{131} decay, 4663

Zeldes, H., Ketelle, B. H. and Brosi, A. R. Radiations of krypton^{85}, 572

Zeldes, N. *See* Racah, G., 1234

Zelikin, Ya. M., Ivanova, N. I. and Klement, F. D. The interrelation of temperature and concentration extinction in some crystal phosphors, 3448

Zemansky, M. W. *See* Cook, D. B., 1065, 1849; Dash, J. G., 2620

Zener, C. Interaction between the *d* shells in the transition metals. I, 4616; II. Ferromagnetic compounds of manganese with perovskite structure, 5670. Theory of D_0 for atomic diffusion in metals, 4773; III. Calculation of the Weiss factors in Fe, Co, and Ni, 7195

Zernov, D. V. On the mechanism of electrical brakedown of solid dielectrics, 359

Zeuner, F. E. Dating the past by radioactive carbon, 2193. Archaeological dating by radioactive carbon, 5685

Zhakovskaya, I. S. *See* Davidenkov, N. N., 2089

Zhdanov, G. *See* Azimov, S., 9568; Rusakov, A. A., 6582

Zhevandrov, N. D. Polarization spectra of anthracene derivatives, 2523

Zhigaĭlo, Y. V. *See* Polyakov, M. V., 2616

Zhukovskiĭ, N. *See* Dzhelepov, B., 6433, 9671

Zhuravlev, V. A. *See* Davidenkov, N. N., 2089

Zhuze, V. P. and Ryvkin, S. M. Fundamental investigation of photoconductivity. II. Photoconductivity of cuprous oxide, 1840. "Exciton" nature of the light absorption and the contamination photoconductivity, 6221

Zienaŭ, S. A note on the mean free path of slow electrons in ionic crystals, 2682. Dielectric relaxation in dilute solutions of polar molecules in a non-polar liquid, 9450. *See also* Arnous, E., 9272; Le Couteur, K. J., 846

Zigler, M. J. *See also* Wolf, E., 4963

Zigler, M. J., Wolf, E. and King, E. S. The influence of surround brightness and short wave components of radiation on dark adaptation, 5949

Zilsel, P. R. Darling's theory and the mass of the π-meson, 6475

Zilverschoon, C. J. *See* Kistemaker, J., 4458

Zimm, B. H. Opalescence of a two-component liquid system near the critical mixing point, 2586. Contribution to the theory of critical phenomena, 7812. *See also* Carr, C. I., Jr, 2590

Zimmerman, E. L., Dale, E. B., Thomas, D. G. and Kurbatov, J. D. The gamma-ray spectrum of Ba^{131}, 2982

Zimmerman, H. K., Jr. *See* Dawson, L. R., 6530

Zin, G. *See* Caldirola, P., 449

Zinnes, I. Polarization correlation of mixed multipoles, 1968

Zinoveva, O. G. Phosphorescence decay in alcoholic solutions of some more simple compounds of the aromatic series at the temperature of liquid oxygen, 1747

Zisler, S. *See* Denise, J. F., 7465

Zisman, W. A. *See* Fox, H. W., 3380

Zlatin, N. A. *See* Vitman, F. F., 8275

Zmuda, A. J. Dispersion of velocity and anomalous absorption of ultrasonics in nitrogen, 6805

Znoĭko, A. P. and Semishin, V. I. Elements 97 and 98, 2951

Zoli, T. The influence of the Stiles–Crawford effect on telescopes luminosity, 1787

Zoller, H. *See* Busch, G., 1048, 3524, 7869

Zolottavin, A. V. *See* Antoneva, N. M., 3728

Zotov, T. D. and Shur, Ya. S. Dependence of the coercive force of powdered highly coercive alloys on particle size, 2841*

Zucker, A. *See also* Schuette, O. F., Jr, 3713

Zucker, A. and Watson, W. W. Concentration of A^{36} and A^{38} and study of the $A^{36}(d, p)A^{37}$ reactions and the beta-activity of A^{39}, 3012

Zünti, W. *See* Aeppli, H., 6445; Baldinger, E., 1323; Frauenfelder, H., 1272; Huber, O., 5698; Jordan, P., 6414; Lüscher, E., 621; Ricamo, R., 1324; Telegdi, V. L., 3768; Walter, M., 2940

Zwanikken, G. C. J. The influence of mutual friction between the two fluids in liquid helium II on the energy dissipation by an oscillating disc, 2623

Zwanzig, R. W. The quantum-mechanical equation of state, 1629. *See also* Irving, J. H., 9297

Zweig, B. Periodic level controller for liquid nitrogen, 6932. *See also* Burdick, M. D., 9418

Zwicky, F. Intergalactic matter, 2316. Tests for the cosmological time scale, 5983

Zwikker, C. Absorption of sound by porous materials, 168

Zwislocki, J. Theory of the acoustical action of the cochlea, 2261. Acoustic filters as ear defenders, 4207

Zwolinski, B. J. *See* Eyring, H., 1416

ALPHABETICAL SUBJECT INDEX

References to individual abstracts are grouped under headings which represent, in the main, general subjects or categories rather than specific names. In the absence of a heading for a particular subject sought, a more general heading should be consulted. E.g. "Zone plates" would be found listed under "**Diffraction**"; "Barkhausen discontinuities" would be found under "**Magnetization.**"

The headings (**bold type**) are arranged in alphabetical order, sub-headings being differentiated by the use of lower case type for the initial letter. Copious cross-references are provided to direct attention to relevant headings.

At the end of the Index (for convenience in reference) will be found a collected list of all the headings employed, grouped into sections by subject on the same basis as the monthly issues of "Science Abstracts." The reader is recommended to inspect this list before commencing a search, so that no heading relevant to his subject may be overlooked.

Substances. The names of a large number of elements, compounds and substances are included as headings; abstracts containing significant physical information are entered under these (with the exceptions noted below) as well as under the appropriate subject headings. Since the index is intended for the use of physicists, no special regard has been paid to exact chemical designation, and as far as possible the familiar names have been used for compounds. Only the simpler of organic compounds have been listed by name. For the present, no entries under substance names have been made for the following: Alloys; most minerals; Crystal structure, molecular; Luminescence, unless of pure substances; Spectra, including Luminescence spectra and Raman spectra; Nuclear species. The names of all substances and nuclei in these categories are, however, quoted in the entries under the respective subject headings. Subject headings have not been included in the Collected List of Headings at the end of the Index.

Suggestions for the extension and improvement of the Index will be welcomed.

An asterisk (*) following an Abstract Number indicates that an erratum will be found on p. vii.

Abacs see *Nomograms*
Aberrations, optical see also *Optical instrument testing*; *Optics, geometrical*
  aberration-free aspheric surfaces development 173
  photographic lens tester 174
  Twyman–Green interferometer study 230
  coefficients calculation 931
  human eye 1551, 4968
  chromatic, used for monochromator 1729
  matrix design method 2499
  pupil, in Kellner-type eyepiece, correction 3425
  wave theory 4228
  axial, of zone plates 5320
  Schwarzschild reflecting microscope objectives 5344
  calc. for optical system 6097
  Seidel formulae after object-ray elimination 6098
  differential correction 6099
  Si–Ge achromatic doublet 6827
  caustics, graphical methods 6828
  photo-objective vignetting 6912–14, 8668
  astigmatism, curvature in electrostatic lenses 7007
  diffraction theory 7659
  correction in Schmidt telescope 8438
  wave equation study 9398
Abrasion see also *Hardness*
  influence of lubricants 866, 3842*
  glass "grinding hardness" 1381
  crystals, X-ray study 2722
  dry friction deterioration processes 3105
  Cu and Fe crystals deformation 3190
  friction surfaces damage invest. 3845
  polished metal surfaces 6501
Absorption see also *Alpha rays*; *Beta rays*; *Cosmic rays*; *Electron beams*; *Gamma-rays*; *Mesons*; *Neutrons*; *Protons*; *X-ray absorption*
  theorem on focusing in absorbing medium 9357
 acoustic waves see also *Noise abatement*; *Transmission*
  attenuation in rarefied He 145
  cylindrical conduit impedance 147
  (*n*, 0) transverse mode in tube 148
  tube attenuation meas. 152
  acoustic filters, theory 162
  by porous materials 168, 6820
  vibrational relaxation times, gases 897
  coefficients determination 917, 1709, 4191
  boundary layer attenuation in tubes 1670, 6798
  in water, rel. to frequency 1674
  theory of sound-proofing 1705
  sound-proofing meas. by velocity meas. 1706
  by cloud droplets 2215
  β-brass relaxation absorption 2466
  meas. apparatus 2470
  long-range, in atmos. 4007
  attenuation coeff., rel. to viscosity 4162
  attenuation in slotted tube 4185
Absorption—*contd.*
 acoustic waves—*contd.*
  volume viscosity and compressibilities deriv. 4192
  effect on new and old violins 4203
  acoustic filters as ear plugs 4207
  random noise in attenuating medium 5185
  high-power, in water 5186
  by gas bubbles at water-metal interface 5187
  by resonant panels 5191
  impedance in energy function terms 5197
  acoustic strip 5205
  glass relaxation spectrum 6804
  tubes, wall viscosity and heat conduction 7634
  in mists 7639
  material with perforated facings 8596
  meas., free field method 8597
  fir plywood panels 8606
  by vibrating plates 9349–50
 ultrasonic
  in liquids, theory 146
  in rubber and rubber-like polymers 165
  coeff., gases, interferometric det. 905
  in critical temp. region 907
  organic liquids classification 910
  23 kc/s, in water due to cavitation 912
  in polycrystals 1669
  in liquids, from thermal considerations 1675
  air humidity effect at 1·46 Mc/s 1676
  liquids, Nernst dist. acceleration 2423
  binary mixtures of unassociated liquids 2467
  in gels 2469, 5192
  effect on NH_4NO_3 transformation 3410
  measurement methods 3415
  effect on crystallization kinetics 3906
  SF_4 crit. temp. region 4183
  in normal- and para-H 4187
  in liquids, reverberation method 4188
  in $MgSO_4$ aq. soln. 4189
  in glycerin, liq. and vitreous states 4190
  in vapours, interferometric meas. 4193
  in nitrobenzene mixtures 5188
  in living systems, amplitude duration rel. 5189
  depolymerization, cavitation 5190
  degradation of polymers 5193
  benzene vapour 6078
  contrib. of thermal cond. 6085
  plastics, attenuation const. det. 6803
  anomalous, in N 6805
  in CS_2, relaxation 7631
  Ni or Fe–Si single cryst., magnetization effect 7636
  molecular theory 7638
  in organic liquids 8595
  in liquids, review 9342
  meas. using prism 9348

A complete list of the Subject Headings will be found at the end of the Index.

Absorption—*contd.*
electromagnetic waves see also *Spectra, radio wave*
by water of crystall. and adsorption, temp. effect 5613
kilometric, in adsorbed water 5614
u.h.f., by opalescent binary liq. mixtures 5615
3 cm, in excited H 8071
u.h.f. in aliphatic ketones, non-polar solvents 9445
light For Absorption spectra see *Spectra.* See also *Atmospheric optics*; *Densitometry*; *Filters, optical*; *Optical films*; *Pleochroism*; *Transmission*
micro-objects, low-temp. 193
rel. to dyes structure 726
thin layers, rel. to photophoresis 921
in gases refractive indices calc. 1715
near-i.r. energy, by glasses 1761
in Ag halide layers 1764
effect on scattering intensity in liquids 1778
i.r. absorption coeffs. in crystals 2562
rel. to suspension particle size and wavelength 2584
O–Cs films 2694
crystals, *F*-centres theory 3196
interrupted i.r. in gas 3402
diamond, visible region 3456
selective, by crystalline lens 4010
amorphous Se, infra-red 5238
i.r., in quartz, mica, CCl_4, by reflection spect. 5270
absolute phase-change study, interferometric 5310
absorbing layers, optical constants det. 5311
Ag films 5316–17
multiple-layers, light dist. functions 5318
alkali halides, impurities dist. 5900
i.r., low-temp. cells 6116
compensating u.v. meter 6117
rel. to molec. orientation 6131
exciton theory 6221
TiO_2, rel. to photoconductivity 6855
CO infra-red 6874
in microcryst. powders, meas. 6878
pressure induced, hydrogen 7174
effect of molecular motion 7638
Br vap. visible band studies 7691
I vap. visible band studies 7692
BaO single crystals 7693
dispersion theory, molecular crystals 7722
Lambert–Beer law validity 7695
N_2O $4 \cdot 5\mu$ band intensity 7751
COS, C_2H_2 i.r. band intensity 7753
$C^{13}O_2$ infra-red meas. 7754
correction cal. in fluorescence meas. 7758
Si and Ge, i.r. 7882
BaO, rel. to photoconductivity 7884
AgBr, AgCl, rel. to photo-effect 7899
meas., effect of slit width 8618
Tl halide salts 8738
sunlight, by clouds 9211
AgI, rel. to photog. props. 9222
Se, coeff., u.v. to i.r. 9361
resulting from 2 valency states interaction 9370
CO, effective av. absorpt. coeff. det. 9382
cryst. stilbene 9390
gradual, in film of non-negligible thickness 9394
by alkali metals 9626
far u.v., gas detect. and press. meas. 9802
Abundance ratio see *Elements*; *Isotopes, relative abundances*
Acceleration measurement
accelerometers, transient response 2406
accelerometer, absolute calibration 3216
Acetaldehyde
photolysis analysis 8302
Acetic acid
limiting negative press. 6768
Acetone
diel. const. at 9400 Mc/s 291
Acoustic analysis see also *Musical instruments*
autocorrelation, of speech sounds 18, 2484
scattered reflection 158
acoustic filter theory 162
speech-peak clipping 166
search-tone methods 913
tuning fork filter 1682
speech spectrum 1698
system-function, of speech sounds 1699
Acoustic analysis—*contd.*
recorded speech 2481
speech correlation function 2483
speech sounds, statistics 2485
sonograph and sound machines 2486
pure tone quality, rel. to freq. 3414
electro-acoustic synthesis, psycho-physical appl. 3417
"residue" new interpretation 4205
automobile horns 4216
multiple-echo effect from stored wave train 5177
analysis without resonance 5211
auditory, of frequency, place mechanisms 5955
Acoustic generators
field of Straubel *X*-cut quartz 155
ultrasonic, textbook 3415
powerful ultrasonic siren 3416
textbook 4180
h.f. piston source 4198*
variable resonant freq. crystal systems 4199
piezoelectric and magnetostriction, ultrasonic, high-powers 4202
ultrasonic, volume magnetostriction appl. 5201
expression for piston sound emission 6806
quartz, ultrasonic, high-output 7640
mechanical breakdown limit 9353
Acoustic impedance
cylindrical conduit 147
finite catenoidal horn 154
animal tissues, ultrasonic freq. 1677
lecture demonstration 3411
in energy function terms 5197
transducer, variations in reflecting field 5198
generalization of concept 8598
measurement
source impedance 152
stationary wave methods 1687, 8604
square wooden tubes 2470
free-field methods 5202, 8597
Acoustic radiators
finite horn response peaks 153
finite catenoidal horn, resonance 154
X-cut quartz, sound field 155
ultrasonic, audible combination tones 904
ultrasonic, magnetostrictive 912
ultrasonic point-sources underwater probe 1679
ultrasonic, quartz 2471
directive loudspeaker array 2473
coupling of coaxial loudspeakers 3412
acoustics textbook 4180
ultrasonic, in water, wave fronts det. 4194
field strength regulator 4195
effects of circular baffle 4196
folded horns, 2 types 4197
h.f. piston source 4198*
plane piston, rel. potential expansion 5194
emitter in infinite well, rel. potl. dist. 5195, 9351
emitter in finite well, field calc. 5196
impedance in energy-function terms 5197
loudspeaker arrgt. in auditoria 5221
direct-radiator loudspeaker, subharmonic oscillations 6795
emitter vibrating freely or in finite wall 6807
high-power piezoelectric 6809, 7641
simple $X(t) - Y$ recorder 7642
wave pattern display, photographic 9352
Kirchhoff's formula and other field equiv. theorems 9616
Acoustic transducers see also *Acoustic radiators*; *Hearing aids*; *Microphones*; *Sound reproduction*
piezo-electric equations of state 142
loudspeaker construction, review 2474
loudspeaker transient testing 2475
magnetostrictive ultrasonics in oil-immersed transformers 3413
wide-range, for physiol. appl. 4200
crystal, variable resonant freq., design 4201
magnetostrictive, electromech. analogies appl. 4568
impedance variations in reflecting field 5198
quartz, underwater sound field meas. 5199
$BaTiO_3$, ultrasonic, large motion 5200
for deaf-aids 6808
for biol. cellular disruption 8599
utilizing pos. thermionic emission 8809

Acoustic wave propagation see also *Absorption*; *Liquid helium, sound propagation*; *Shock waves*; *Velocity, acoustic waves*
in rarefied He 145
in cylindrical conduit 147
(n, 0) transverse mode in tube 148
pulses, group velocity 149
under anisotropic conditions 1667, 5176
from moving source 1668
through cloud layer 2215
Helmholtz waves in atmosphere 2235
in sea and atmosphere, review 2236
sound channels, normal modes 2462
boundary layer transmission 2465
inconsistency in propagation equations 3395
compressional waves in atmosphere 4006
long-range 4007
textbook 4180
guided sound waves 4181
l.f. cavitation effects 5149
multiple-echo from stored wave train 5177
through steel plates in water 5184
velocity potential, piston source 5194
emitter in infinite wall, vel. potl. dist. 5195
emitter in finite wall, radiation field 5196
Wiener–Hopf techniques and boundary value problems 6082
sigma phenomenon 6083
air circulation near reed 6086
in flat speaking tube 6794
in CO_2 near critical point 6799
in colloidal suspensions, electrical effects 6981
in compressible, variable-viscosity fluid 7586
in heterogeneous material, review 7628
biol. cells, resonances 7632
effect of relaxation on gas flow 8579
along const. normal impedance boundary 8592
along boundary 8593
in ocean, effect of local temp. irregularities 8594
in 1-dimensional structures 8871
directive, correl. function analysis 9343
interaction with screw dislocation 9344
pattern display, photographic method 9352
ultrasonic
Ni rod, magneto-acoustic effects 911
effect on colloidal S and ice 1436
in polycrystals 1669
polymer degradation 3178
in liquids, textbook 3415
wave fronts det. in water 4194
from piston source 4198
variable resonant freq. generator 4199
in ferromagnetics 6081
light diffraction by ultrasonic waves 6148
plastics propag. constants det. 6803
effect on phase change rate, organic subst. 7329
field intensity dist. in liquids 7629
cavitation by different freq. 7630
molecular theory 7638
in liquids review 9342
audible combination tones from u.s. radiators 904
Acoustic waves see also *Diffraction, Interference, etc.*; *Elastic waves*; *Shock waves*; *Ultrasonics*
ultrasonic, method of making visible 160
colloidal systems nucleation 1436
focusing by parabolic mirror 1678
in gas, force on body moving through 1683
quantized, Bloch's method many-fermion problem appl. 3324
in vapours, wavelength interferometric meas. 4193
steady forces due to, theory 5210
radiation press. calc. 7644
radioactive dust separation appl. 9876
Acoustical laboratories
echo-free rooms 1686, 6089
Acoustical measurements see also *Interferometry* and under separate subjects, e.g. *Intensity measurement*
acoustic filter theory 162
ultrasonic fields in fluids 163
ultrasonic interferometry, satellite resonances 906
studio reverberation times and absorption coeff. 917
absorption coeff. in water 1674
in echo-free rooms 1686
Acoustical measurements—*contd.*
audiometer calibration 1688
commercial audiometers, performances 1689
speech sounds specification 1701
earphone response methods 1704
synthetic reverberation apparatus 1708
absorpt. coeffs., box method 1709, 4191
ear, mechanical system, damping constant 2260
auditory sensitivity, watch as sound source 4011
transmission through sample partition 4186
u.s. absorpt. in liquids, reverberation method 4188
ultrasonic wave fronts det. in water 4194
textbook 4209
h.f. sound pressures, abs. 4212
resistance, survey of methods 4214
interferometric, ultrasonic velocities, l.p. gases 5178
quartz transducer underwater field 5199
ultrasonic microphone, reflected signals and pick-up effects 5213
aural harmonics, masking error 5214
bone conduction receiver, testing 5216
anechoic chamber 6089
automatic reverberation meas. app. 6090
decibel, dimensional analysis 6815
porous material absorption coeff. 6820
radiation press. calc. 7644
loudness, objective meas. 7646
hearing aid testing 8603
Acoustics see also *Architectural acoustics*; *Atmospheric acoustics*; *Hearing*; *Noise*; *Resonators, acoustic*; *Sound reproduction*; *Speech*; *Ultrasonics*; *Vibrations*
acoustic filter analysis 162
closed spaces, theory 2458
fundamentals, textbook 4180
electroacoustics, terminology standards 7627
musical see also *Musical instruments*; *Scales, musical*
mistuned intervals, non-linear distortion 159
singing voice, fundamental phenomena 3418
pitch/frequency rel. 4204
organ flue pipe voicing 4206
of organ 5206
duplex theory of pitch perception 6662
dissonance sensation, physiological origin 6663
standard pitch, broadcasting 6811
musical strobographs, tuning appl. 7643
Adhesion
adhesives gelation, rheological changes 1380
adhesion theory of friction 3107, 6519
monomolecular layers to support 3833
in lubrication theory 3835
surface films effect, non-metals 9038
Adsorbed layers
lubricant films, radioactive tracer study 866, 3850
adsorbed films surfaces potential det. 1035
statistical treatment of chemisorption 1414
boundary layers, molecular exchange effects 3150
monolayers on solids, thermodynamics 3159
thermodynamic methods, appl. 3160
A on graphite, phase transitions 6540
water vapour on solids, film thickness 6542
lubrication of metals 8278
dielectric behaviour 8312
mobility in, effect on flow in porous media 8569
water on inorg. cryst. diel. props, 8714
effect on friction, non-metals 9038
interactions between adsorbed molecules 9047
dielectric const. in double layers 9067
coagulation phenomenon, review of theories 9073
adsorbed films, oil-water interfaces 9083
mixed films on activated C 9086
He anomalous first layer 9090
A, heat capacity, "fusion" 9091
surface diff. coeffs. and activation energies 9325
capillaries blockage in porous solids 9790–1
Adsorption see also *Chromatography*; *Films*; *Heat of adsorption*
gases in solids, differential eq. 123
Kelvin's contributions 708
Gibb's adsorption isotherm integration 713
flowing vapour 714
gas, influence on polymorphous transformations 716
N on Fe, energy calc. 717

Adsorption—*contd.*
- gases on Ni films, surface potential 1034
- on SiO_2 gel, X-ray scatt. 1353
- semiconductivity var. due to adsorbed gases 1400
- surface layer properties, metals 1409
- role of heterogeneity 1410
- H chemisorption by W films 1411, 3877
- active centres hypothesis 1412
- Cu oxide surface reactions and catalysis 1413
- chemisorption heat calc. 1415
- activated complex in chemisorption 1416
- surface reaction and catalysis 1417
- in inhomogeneous surface catalysis 1418
- sorption columns, Ψ conditions 1445
- sorption columns, ion exchange 1446
- sorption columns theory 1447–8, 6543
- crystal structure, rel. to adsorption phenomena 1450
- CO_2 on reduced Ni 1451
- gases on metal films, invest. tech. 1452
- surface, from mixtures 1453
- insol. vapours on H_2O surface 1455
- desorption rate rel. to surface coverage 2122
- chemisorption and catalysis 2123
- on oxides, and catalysis 2124
- gases on metals, in catalysis 2125–6
- on colloidal particles, interaction 2136
- resulting expansion of charcoal 2142
- gases, in capillaries and on particles 2143
- multimolecular, statist. thermodynam. 2144
- and desorption H isotopes, tunnel effect 2145
- cellulose swelling, adsorbed water sp.ht. 3153
- critical and surface phenomena, statist. thermodynam. 3154
- H. on promoted Fe synthetic NH_3 catalyst 3156
- CO and H on $ZnO–Cr_2O_3$ methanol synthesis catalyst 3157
- N on promoted Fe synthetic NH_3 catalyst 3158
- adsorptive layer phase state 3161
- capillary condensation 3162
- N on single crystal Cu, anisotropy 3166
- purification in solid phases 3168
- crystals, thermal disorder effects 3197
- MoO_3/H_2 system 3802
- water by dehydrated alum 3871
- CO, N, A and O on CsI 3872
- $N_2 + CO$ and $A + O_2$ on CsI 3873
- comparison of B.E.T. and Langmuir 3874
- N from N–He mixt., meas. in surface det. 3875
- O and CO on W films, surface areas det. 3876
- He, mobile multilayer 4345
- chemisorbed O on charcoal 4859
- l.p. "physical," structural model 4860
- gas, as area det. method, kinetics 4861
- multilayer, gas, surface tension effect 4862
- benzene vapours by active C block 4863
- isotopic exchange rates, rel. to surface texture 5850
- new isotherm, previously adsorbed molecules 5877
- isotherms for 2 layers, calc. 5878
- from multicomponent systems, statist. mech. 5879
- from gas mixture, van der Waals' eq. appl. 5880
- thermal effects, powder surface det. appl. 5881
- gases by semiconductors 5882
- gegenion, radiotracer study 5883
- divalent ions in hydrous ferric oxide 5884
- evap. and mobility, naphthalene molecules 6169
- B.E.T. theory 6539, 9090
- gases on metals, room-temp. 6541
- gases on crystallized bodies, effect on m.p. 6544
- gases, effect on NiO reduction by W 6545
- absolute isothermals on silica gels 6546
- gases, effect on quartz $\alpha \rightleftharpoons \beta$ transformation 6925
- of H_2O by metals 7355
- O, in semiconducting oxides 7868
- phys. chem. textbook 8280
- isotherms for $n = 3$ 8310
- new multilayer isotherm equation 8311
- chemisorption of H on reduced Cu 8313
- ammonium phosphomolybdate props. 8314–15
- gas flow study 8570–1
- porous adsorbents surface area det. 8999
- parahydrogen conversion on W 9058
- rate on non-uniform surface 9082
- polar org. compds. on steel 9084

Adsorption—*contd.*
- sorption hysteresis, size of loop 9085
- thermodynamics 9087
- Huttig's multilayer isotherm 9088
- multilayer, equation of state 9089
- det. of adsorbed H_2O by D_2O exchange 9759
- N and O on gibbsite, heat treatment effect 9784–5
- surface areas calc., eq. compared 9786
- gel sintering studies 9787
- non-porous powder surface meas. 9788
- gases on loose powders and porous plugs 9790–1
- rational unit, the "gibbs" 9792
- **measurement**
  - dielectrics, vac. torsion balance 8542

Aerials see *Electromagnetic waves, radiators*

Aerodynamics see also *Aerofoils*; *Flow, gases*; *Jets*; *Shock waves*; *Supersonic flow*
- cooling effects 2452
- aircraft stability equations, analogue computer 3259
- equations of motion 3362
- sound-wave propagation eq. inconsistency 3395
- rel. dist. models, electrolytic tank 3396
- Hermite's eq. soln., new form 3399
- drag of free water surface 5167
- gas columns impact 6072
- aerodynamic heating at high speeds 7613
- forked compression shock theory 9332
- heat transfer studies 9335

Aerofoils
- compressible flow past thin wings 889
- symmetrical profile, rel. dist. 3397

Aerosols see also *Foams*
- iron oxide, magnetic particles 712
- particles charge meas. 1068
- salt, micellary size, temp., influence 1440
- liquid, formation and meas. 2139
- electrification of dust clouds 2656
- precipitator for flue gas analysis 3167
- vapour and ice, atmospheric, light scattering 3235
- atmospheric, nuclei counter 4916
- coloured fog, photophoresis invest. 5223
- elec. invest. method 5875
- stirred, coagulation and deposition 8308
- drop-size distrib., new equation 8551
- shatter of drops in air streams 8556
- drop transfer to duct walls 9076
- liquid and solid, preparation 9078
- bimodal size distrib. curves 9079

Air
- 2nd enthalpy coeff. 278
- dielectric properties, microwave meas. 2664, 8717
- dispersion, 2 500 Å–6 500 Å 5239
- diel. const. and refract. index, 24 000 Mc/s 5616
- magnetic rotatory power 5618
- sparks, cathode oxide layers 6235
- heat conduct. and viscosity data 7607
- average excitation potential 8805
- stratosphere, chem. composition var. 9846

Alcohol see also individual alcohols
- solid long-chain, dielectric props 8722

Algebra
- Weyl's inequality 779

Alignment
- adjustment of interferometer plate 1766
- 3-point, interference appl. 2500, 4225
- high precision meas. 2500, 4225
- sunlight sighting device 5340
- electro-optical method, surveying appl. 7577

Alkali halides see also individual halides
- solns., molecular properties 116
- X-ray luminescence spectra 222
- trapped hole colour centres 731
- colour centres, luminescence 732
- crystals, lattice oscillations anharmonicity 747, 7379
- electrical and photographic properties, plastic flow influence 1477
- crystals, photo-electric current rel. to time 1844
- compressibility and absorption freq. rel. 2104
- thermal expansion, X-ray and direct meas. 2605
- *V*-centres 2522
- crystals, diel. dispersion 2671
- Tl-activated, X-ray luminescence spectra 3458
- exciton-enhanced photoelec. emission, mech. 4392

Alkali halides—*contd.*
solid solns., lattice const. 4771
with colour centres, new u.v. absorption bands 5272
diel. const. rel. to pressure 5393
impurities dist., optical data 5900
chlorides, epitaxy on metals 6563
coloured, paramagnetic resonance 7091
crystals with added divalent ions, colour centres 7381
crystals, thermal conductivities, low temp. 7802–3
irradiated cryst., electron traps and conduction 7863
molecules, binding energy and dipole moment 8108
effect of electron bombardment 8253
crystals, dielectric breakdown 8757
crystals, current noise and diel. breakdown 8759
crystals, Po α-rays range 8788
crystals, as integrating photon detectors 8796
Allotropes see *Thermal transformations*
Alloys see also *Steel*
superconductive, heat flow 326
ferromagnetic, superlattice, formation 482
ferromagnetic, atomic moments 560
diffusion rates 659
K-emission discontinuities of Al and Mg 1085
order-disorder theory 1211
precipitation-hardening, X-ray diffusion 1354
two-phase, deformation and recrystallization 1367
precipitation-hardened, creep 1376
electronic structure, rel. to dehydrogenation catalysis 1420
single crystals, electron diffraction study 1518
X-ray valences band spectra, and heat of formation 1866
ternary, Al-rich, intermetallic compds. 2267
cold-rolled, resistivity anisotropy 2680
ferromag., progressive intermittent activation 2820
highly coercive, magnetization temp. dependence 2839
permanent magnet, anisotropic, theory 2831
powdered, coercive force rel. to particle size 2841*
expansion charact., glass-metals seals study 3480
ordered ferromag., magnetic props. 3630
cohesion, theory; Cu, Ag, Au, calc. 3677–8
ditto, group IA metals 3679
binary body-centred, superlattice effect on modulus 3816
for instr. manufacture, development 3827
ultrasonic waves effect on crystallization 3906
binary, order-disorder theory 3909
ordering alloy system, phase equilibria 3911
anomalous elec. resist. changes 4374
complex lattices, *d* shells interactions 4616
lattice transformation, temp. interval 4795
lattice transformation rel. to slip 4796–7
binary, order parameters 4898
spectroscopic anal, effect of air press. 5242
ternary amalgams, thermodynamic invest. 5811
rolled plates, crystal orientation 5814
binary, disordered, diffuse X-ray scattering 5819
cementite formation, electron diffraction invest. 5823
anomalous mag. props. 6312
ferromag., coercive force theory 6321
antiferromag., exptl, evidence 6331
superstructure transitions, kinetics 6354
ferromagnetic, magnetostriction meas. 6372
creep resistent 6515
ageing, diffuse X-ray scatt. intensities calc. 6570
thermal conductivities, low temp. 6920
permanent magnet, progress 7076
ferromag., saturation intensity, etc. 7103
transition metals, ferromagnetism, paramagnetism and cohesive energy 7069
phase boundary det., diffusion technique 7304
metal physics progress, review 7439
magnetostriction coeff. sign-change due to tension 8079
β-phase overlap forces and elastic const. 8084
body-centred cubic, superlattice formation 9015
chemical production as powders 9888
Al, corrosion studies 703
Al 0·5%Ag, creep invest. 688
Al–Ag, Al–Mg evaporated films, reflectivity 225
Alcomax, torque curves and other mag. props. 8042

Alloys—*contd.*
"Alfer," magnetostriction, dynamic characteristics 8034
Alnico V, magnetization mechanism 1188
Alnico V magnetic anisotropy 1936
Alnico V, precipitation and domain struct. 4527
Alnico magnetostriction hysteresis 8048
Al–Zn, anelastic effects from precipitation 7323
Al–Zn system, α, α' phases theory 8406
Ag–Au short range order, X-ray meas. 4784
Ag–Mg, superstructure of α phase 1355
Ag–Mg, evap. films prep. 8248
Ag–Mn, low temp. resistance 8727, 8744
Ag–Zn, Zn diffusion 2079
β–AgZn, long-range order 5922
Ag–Zn, ζ-phase struct. 9146
A.E.C., creep studies 4770
amalgams of Zn, Cd, Tl, Pb, Cu, polarographic behaviour 3180
Au–Cd, thermal exp. 4332
Au–Ni solid solns., atomic arrangements 9736
Be–Au in Be allotropy invest. 753
superconductivity of Bi_2K 9484
brass, sound velocity 903
brass elastic constants, pulse method 1362
α-brass slip-lines branching 7320
β-brass elastic parameters 3817, 8260
β-brass, long-range order 3910
β-brass relaxation 2466, 6493–4
$CdMg_3$, order formation 3068
Co–Cr sigma phase, crystal structure 3912
Co–Cu, magnetic props. 1923
Co–Mn system, ordered, magnetic charac. 8021
Co–Zu, β_1-phase ferromagnetism 8030
Cr diffusion in iron and steel 3064
Chromani B 2 Mo thermal conduct., low temps. 1010
Cr-permalloy mag. after-effect study 5591
Cu, plasticity and conductivity correl. 3098
Cu amalgamated electrode, temp. coeff. 3860
solid Cu_3Au, local order 1356
Cu_3Au, thermo-elect. power, transf. effect 1855
Cu–Au, order-disorder transf. 2086
Cu_3Au, long-range order 3910
Cu–Au, ordering kinetics 8290
superlattice $CuAu_3$ 6485
Fe solubility in Cu 9014
Cu–Mg, oxide films election diff. study 9742
Cu–Mn system, thermal properties 3067
Cu–Ni, thermal con. at low temp. 3479
Cu–Ni–Fe, modulated structure 9018
Cu–Zn, X-ray diffraction 3210
Duralumin contact potential invest. 1032
Gd–Mg, Mg-rich, prep. and mag. props. 7095
Fe, C and N precipitates 4791
Fe group, isoelectronic, mag. props 4524, 7075
$Fe_3Al_{1-x}Si_x$, ferromag. superlattice studies 5567
FeB_2, ferromagnetism 6343
Fe–Co, single crystal magnetostriction const. 1956
Fe–Co–Cr–Ni, creep invest. 9033
ferrochromium tearline patterns 686
Fe–N, prep. and cryst. struct. of γ and α' 8407
α''–Fe nitride, occurrence and struct. 8408
Fe–Ni, mag. props, 1927–8, 7074, 7081
FeNi–Cu, mag, props. 1923
Fe–Si, magnetic props. 506, 1186, 7081, 7084, 9624
Invar thermal expansion elimination 4331
$MgCu_2$–$MgZn_2$, influence of Brillouin zones 8040
Mg_3Sb_2, barrier layers 5404
mixed Mg–Zn ferrites, mag. props. 5558
MnBi, elec. conduct, and galvanomag. effects, low temps. 1925
Mn–In, ferromagnetism 6345
Mn, with Ni and Co, magnetic resources 3627
Mo-permalloy resonance absorpt. at 3000 Mc/s 2832
Na_xWO_3 elec. props. 9463
Ni, magnetostriction 5623
Ni, spontaneous magnetization 8848
Ni, magneto resistance at low temps. 8866
Ni amalgam., non-ferromag. ferromag. transition 2612
Ni–Co, lattice parameters 749
Ni–Cr–Fe metal-to-glass seal 772
Ni–Cu, Young's modulus interferometric det. 8261

A complete list of the Subject Headings will be found at the end of the Index.

Alloys—*contd.*
  Ni–Fe, magnetization curves 506
  Ni–Fe catalysts, electronic factor 1422
  NiFe, grain growth 5904
  Ni–Mn, even thermomag. effect anomaly 8078
  order in Ni_3Mn 9019
  Ni/Zn ferrite, Young's modulus meas. 7314
  Pa–Au, lattice structure rel. to catalytic activity 1421
  Pb–Bi, heat flow in normal and superconductive state 2705
  Pb–Bi, segregation 8240
  Permalloy, magnetic viscosity 8041
  Perminvar, Barkhausen jump, internal stress 8046
  of Se, rectifying characteristics 7854
  Si–Fe magneto-resistance 1954, 6371
  Sn–Ge "alloys," superconductivity 322
  Sn–Zn system, viscosity relationships 107
  Te–Se solid solution studies 9739
  Ti–Cr–Fe, Ti–C, electrolytic micrographic study 3075
  U–Fe system 774
  U–Mo, constitution 773
  Vicalloy, magnetostriction hysteresis 8048
  W bronzes, magnetic susceptibility 1181
  ZnSb, barrier layers 5404
Alpha-ray spectra
  complete reference tables 2938
  artificial chains collateral to heavy families 4653
  Am isotopes 565
  At isotopes 4655
  B disintegration by slow neutrons 3776
  Be^9 excited state 3712
  $Be^9(d, \alpha)$ Li^7 3764
  Bi, natural 8158
  Bk^{243} 2949
  $C(d, \alpha)$ reaction 9695
  Cm^{243} 2949
  $Cf^{244, 246}$ 2950, 3762
  $F^{19}(p, \alpha)O^{16*}$ 2037
  Io track analysis 6419
  $Li^6(n, \alpha)H^3$ 4734, 4738
  $Li^7(p, \alpha)He^4$ 3764
  Li^8, cosmic-ray stars 2803
  $Mg(d, \alpha)$ 9695
  $N^{14}(d,\alpha)C^{12}$ and $N^{15}(d, \alpha)C^{13}$ 4714
  $Na^{23}(d, \alpha)$ 3765
  $O^{18}(p, \alpha)$, $O(d, \alpha)$ 5750, 9695
  $P^{31}(p, \alpha)$ Si^{28} 4704
  Po isotopes 4649, 5688, 6453, 7224
  $Pu^{239, 240-2}$ 3721, 3732
  Rb^{87}, γ–α reaction 5761
  ThC′, $B\rho$ values 6453
  U^{235-6} 6404, 7223
Alpha-ray spectrometers
  magnetic, double focusing 1115
  differential ioniz. chamber 6456
Alpha-rays see also *Cosmic rays*; *Radioactive disintegration theory*; *Radioactivity*
  evidence for magic numbers 539
  α–γ correlation, short range 583
  ditto, $F^{19}(p, \alpha\gamma)O^{16}$ 1301
  $O^{18}(p, \alpha)N^{15}$ thin target yield 609
  binding energy 1230
  from AcA and RaAc, intensities 1265
  natural alpha-radioactivity theory 1279
  from ground state Be^8 1306
  long-range, from slow-neutron fission 1314
  thin Po source fluxes, calc. 1987
  B^8, Na^{20}, N^{12} delayed alpha-emitters 2003
  alpha radioactivity, rel. to heavy nuclei stability 2007
  alpha-active rare-earth region isotopes 2008
  natural α-emitting elements, linear property 2964
  At^{211} alpha-decay, Auger coeff. det. 2983
  $N^{15}(p, \alpha)C^{12}$ thin-target yield 3004
  new α-emitters? 3723
  from C^{12} photodisintegration 3768
  photodisintegration and reverse processes 3769
  alpha-particle mass det. 4706
  α–β correlation in Li^8 disinteg. 5703
  α-emitter systematics 5710, 6421
  non-central electric interaction 5711
  $Li^6(d, \alpha),\alpha$ total yield 5756
  alpha-disintegration, wave-statistical theory 6422

Alpha-rays—*contd.*
  $PbCl_2$ and PbI_2 bombard., recoils det. 6451
  α–α coincidences, $Li^7 + d \rightarrow 2\alpha$ 6456
  Ra^{226}, abundance of low-energy group 7224
  photodisintegration by 100 MeV betatron X-rays 7271
  ditto, 300 MeV bremsstrahlung 9707
  from $B^{10} + n \rightarrow Li^7 + \alpha$, radiog. appl. 8419
  from p on Al, yield 8964
  yield from protons on Cl 9692
  photodisintegration theory 9703
 absorption
  range in emulsions 2994, 3581, 6270, 7957, 8789
  1–2·3 MeV, range in air 5709
  stopping power of water 5712
  Po α-rays range in alkali halide crystals 8788
 angular distribution
  from $Al^{27}(d, \alpha)Mg^{25}$, 2039
  from p on F 3000
  $Li^7(p, \alpha)\alpha$ 4707
  from p on Be 4708
  from d on Be 5757
  $T(d, n)He^4$ 5758
  from $Li^6(d, \alpha)He^4$ 7261
 detection, measurement see also *Alpha-ray spectrometers*; *Counters*; *Counter tubes*; *Radioactivity measurement*; *Radiation monitoring*
  $B^{10}(p, \alpha)Be^7$, magnetic analysis 606
  methods, review 2007, 5684
  photosensitive G.M. counters 3582
  students' ionization-chamber counter 3586
  scintillation counter, U and Th est. appl. 3587
  statist. dist. on photographic plate 3716
  sewage effluent, evap. method 4012
  rare activity, special emulsion appl. 6401
  quantitation of α emitters in bone 8154
 effects see also *Nuclear reactions, alpha-rays*
  destruction of phosphor luminescence 209
  electrons released by, in NaCl crystals 1126
  gas ionization, work per ion pair 1140
  H and D specific ionization 1141
  ionization by recoil particles 1143
  H_2O_2 production, irradiated water 2134
  *iso*butene polymerization 2135
  organic compos., scintillations 2573
  Ge conductivity changes 2687
  tracks, reproductions 2801
  ionization yields 4485
  microcrystal formation on irradiated surfaces 4895
  biological effects 4973
  on CdS luminescence 5298
  deterioration of anthracene scint. 6140
  colour centres in rocksalt 9407
  ditto, with colloidal Na 9408
  decomposition of water 9773
 scattering
  anomalous, by spinless nuclei 2965
  from nuclei, rel. to deuteron scattering 2994
  20-MeV, by He 6268
  resonances, line form 8164
Altimeters
  radar, continuous recording 822
  recording microbarometer 6782
Alumina
  electrical conductivity 2681
  Al–Al_2O_3-electrolyte semiconducting charact. 2686
  dielectric breakdown, high temp. 5446
Aluminium
  ultrasonic soldering 161
  stress-strain curves 665
  corrosion, heat treatment and impurities effect 703
  sound velocity in 903
  contact potential time variation 1032
  cathodes, H–D exchange process 1070
  grain boundaries in melting 1351
  elastic constants, pulse method 1362
  density variations, rel. to structure 1375
  atoms, transport by gas 1662
  elastic constants calc. 3088
  crystal, discontinuous elongation 3093
  solutions, electrolysis in mag. field 3145
  suspension in vaseline, conducting-bridge formation 3550

Aluminium—*contd.*
- monocrystals, plastic deformation effect on X-ray scattering 3803
- bent-crystal technique 4419
- evap. film, blister production 4780
- internal friction meas. 4804–5
- high purity, creep 5838
- cell mechanism and boundary micro-flow 5839
- suspensions, elec. cond. 6248
- de Haas–van Alphen effect 6326
- highly stressed, recovery, recryst. 6513
- critical magnetic field 6979
- evaporated films, electrical conductivity 7887
- thermal ionization 7984
- low temp. heat conductivity 8678
- range of fast electrons 8776
- average excitation potential 8805
- single crystals, strain rate effect on plastic deformation 9029
- effect of deformation on elec. resistivity 9496

Aluminium fluoride
- thin film refractive index 2575

Aluminium oxide
- films, diel. strength 293
- porous layers, capacity 1345
- secondary electron emission 2749

Ammonia
- diel. const. at 9 400 Mc/s 291
- catalytic oxidation, mechanism 1397
- dielectric properties, microwave meas. 2664
- intermolecular forces 2889, 4579

Ammonium arsenate
- elastic compliances 2157

Ammonium bromide
- crystal, thermal expansion 3188

Ammonium chloride
- crystal, thermal expansion 3188
- substituted, λ-point transition 7811

Ammonium halides
- molten Hg and NH$_4$ halide systems, elec. conduct. 2692

Ammonium nitrate
- thermal decompn., O and N isotope effects 1396
- NH$_4$NO$_3$, anomalous phase change 2613
- effect of ultrasound on polymorphic transf. 3410

Ammonium phosphate
- elastic and piezoelect. coeffs. 5174
- breaking stress as piezoelectric transducer 9353

Analogue computers see *Calculating apparatus*

Anemometers
- pulsating flow error 137
- wet test gas meters 138
- hot-wire, turbulence invest. 139, 894, 1660, 8583
- hot-wire methods, contributions 140
- direct indicating type 758
- electrical, development survey 759, 9195
- wind and gust recorders 760, 9196
- shielded hot-wire, compensating circuit 895
- ship true wind vel., electrical method 1533
- hot-wire, low-speed, calibration 1661
- wind-run and wind-direction, electrical 2195
- mean-wind-velocity, for ships 2199
- sensitive electric contact cup 3230
- review, bibliog. 3965
- portable, recording, pressure-plate 7403
- error in fluctuating winds 8373
- thermocouple, air temp-compensation 9336

Angle measurement see also *Alignment*
- interferometric 4130
- electro-optical method, for surveying 7577

Aniline
- limiting negative press 6768
- droplets, light scattering 7785

Annealing see *Heat treatment*

Antennae see *Electromagnetic waves, radiators*

Anthracene
- crystals, scintillation eff. 985
- scintillation efficiency for slow β-rays 1127, 2766
- electron energy studies 4470
- fluorescence quenching 5292
- directional fluorescence 5297
- scint. counter, response to protons 5498

Anthracene—*contd.*
- crystal, neutron detector appl. 5809
- deterioration under α-bomb. 6140
- bond-length prediction 7162

Antimony
- Cs–Sb layers, photoelectric emission 1062
- electrode, electrochemical behaviour 1428
- thin films, Hall coeff. and resistivity 1827
- alloys with Mg, Zn, barrier layers 5404
- de Haas–van Alphen effect 6326

Apparatus see *Cosmic rays, apparatus*; *Instruments*; *Ionosphere measuring apparatus*; *Laboratory apparatus*; *Radioactivity measurement, apparatus*; *Vacuum apparatus*; *X-ray crystallography, apparatus*

Architectural acoustics see also *Echo*; *Noise abatement*; *Reverberation*; *Transmission*
- coupled rooms 167
- absorption by porous materials 168
- intelligibility in rooms 916
- Radiodiffusion Française studios 917
- echo-free rooms design 1686
- rel. to microphone acoustics 1707
- synthetic reverberation apparatus 1708
- closed spaces acoustics, theory 2458
- "white noise" defn. 2487
- speech reinforcement systems 3421
- textbook 4180
- transmission through partition, meas. 4186
- absorption by resonant panels 5191
- organ acoustics 5206
- insulation by single and double walls 5220
- arrangement of sound sources 5221
- broadcasting auditoria, diffusing walls 5222
- anechoic chamber for meas. 6080
- porous material, acoust. props. 6820
- Royal Festival Hall 7647
- ultra speed recording of characteristics 8605
- absorption by vibrating plates 9349–50

Arcs, electric
- C arc temp. field 337
- C, field of flow 338
- molecular cross-section in air 339
- Hg, resonance phenomena 343
- electron velocity dist. 344
- hot-cathode, in C5 vapour 345
- l.p. discharge plasmas 346
- Hg h.p., ionisation potential 355
- Hg h.p., continuum origin 356
- breadth of wall-stabilized discharge 357–8
- impedance, microwave study 1071
- high-current arc stream as high temp. plasma 1072
- initiation invest. 1077
- Xe, h.p., u.v. radiation 1788
- short-duration, high-intensity, as light source 1789
- temps. det., survey 1862
- as spectrochem. light source 4326
- wall-stabilized, temp. dist. calc. 4401
- a.c. circuit lamps, theory 4402
- wall-stabilized discharge, breadth 4403
- high loading discharge 4408
- Hg, wall-stabilized, h.p., temp. meas. 4409
- heavy-current, in transverse mag. field 5433
- triggering circuit, cloud-chamber photog. 5502
- Na, N excitation 6106
- compact Xe lamp 6162
- metallic, temp. meas. from hydroxyl spectrum 6181
- water-stabilized, field strength meas. 6236
- v. high temp., meas. 6237
- Gerdrén, column temp. meas. 6238
- l.p., hot-cathode spectral lamps, fluctuations 6242
- Cd lamp terminal voltage 6243
- Hg, resistance ignitor 6244
- H, excitation temps. 6246
- H, Balmer line widths, ion conc. 6247
- at contacts on closure, rel. to surface 6989
- radiation emission theory 7652
- spectrographic light source, CN band elimination 7798
- technique for initiation 7919
- potl. field, influence on disch. mech. 7923
- stability in O$_2$, H$_2$, He 8750
- separation of electrodes *in vacuo* 9412
- at contacts on closure, initiation 9507

Area measurement see also *Surface measurement*
microphotometer area determinator 8541
porous substances see *Surface measurement*
Argon
zero-pressure thermodynamic properties 275
molecules, internal mechanics, interatomic potential function 556
in K salts, mass spectrometer meas. 561
CO$_2$/A thermal diff. coeff. press. dependence 896
secondary electron production from Mo 1319
neutron scattering cross-section 1328
molecular and atomic ion mobilities 1891
thermal transpiration 2435
self-diffusion temp. dependence 2455
shock front thickness and heat capacity lags 4184
slow A particles ionization yields 4485
fluorescence yield 5294
magnetic rotatory power 5618
crystal, triple-dipole interaction 6373
adsorption on graphite, phase transitions 6540
atmospheric, origin 6623
heat conduct. and viscosity data 7607
thermodynamic properties 8574
metastable atoms in discharge 8753
X-ray scattering, theory 8764
heat capacity of adsorbed layers 9091
dielectric const., up to 2 700 atmos. 9447
X-ray absorption edges 9516
Arsenic
photoconductivity, charac. 6972
susceptibility evaluation 8024
Arsenic sulphide
conductivity under electron bombardment 5412
Association
condensation theory, critical phenomena appl. 1798
gases
cluster integrals 6924
liquids see also *Colloids*
theory of phys. props. discontinuities 1648
water, calculation 2421
dipolar molec. from diel. relax. period 2430
due to lone-pair electrons 2432
theory of water structure 2433
Debye effect, ultrasonic study 2476
study of thermo diffusion 3385
organic, Raman spectra indications 3460
effect on lubricating props. 3849
from sound vel. meas. 4213
nitrobenzene mixtures, ultrasonic absorption 5188
polar chain molecules in pure liquid 5397
dielectric effects 9440
Astronautics
space-rocket trajectories 102
rocket speed limit? 3351
orbital rockets design 6763
aerodynamic heating at high speeds 7613
radiation effects on man in space 8388
Astronomical instruments see also *Telescopes*
errors due to emulsions 19
radio-wave, review 792
heliomeridianscope 1574
telescope spectrograph 2308
coarse gratings in magnitude det. 2338
solar protuberances, i.r. phosphophotography 3267
an *f* : 1·0 spectroscopic camera 5008
photoelectric photometry, review 5981
interference polarizing filter, temp. effect 7453
interference filter for solar study 7454
photoelectric photometers 3269, 7455
positional effect in photomultipliers 7476
solar spectroscopy, recent advances 7668
etalons in solar spectroscopy, review 7780
oscillation counting method of raising photog. sensitivity 8439
photoelec. recording of scintillations 8440
photography using photocathode image formation 8607
pivot errors of transit 9232
new form of transit 9233
Astronomical observations see also *Errors, astronomical*
astrometric accuracy, film errors 19
solar radio-frequency radiation, survey 32
solar corona, new method 36
Astronomical observations—*contd.*
radio-wave, review 792
colours and magnitudes, photoelectric det. 816
photometric, of planetary atmos. 2322
galaxy photometry 3268, 1586, 5009
artificial repetition, short-lived phenomena 4040
solar flare corpuscle streams 5031
stars and nebulae, p.e. photometry, review 5981
spectroscopic parallaxes appl., survey 6001
solar spectrum, electrophotometry 5994
oscillation counting as invest. method 8439
photoelec. recording of scintillations 8440
meteors, photoelectric photometry 8441
radio stars survey 9234
bright stars, magnitudes, E region, Fabry method 9245
solar radiation studies 9848
Astronomical orbits see *Orbits*
Astronomical spectra see also *Night sky*
C$_2$ and N$_2^+$ transition probabilities 185
review of progress 5044
molecular spectra research, review 5260
interstellar lines, molecules density 6682
exptl. data on H-emission 7480
atomic spectra data, survey 7675
aurora see *Aurora*
nebulae
two-colour indices and gen. relativ. 9247
planets
planet and satellite atmospheres 25
planetary atmospheres, review 7460
stars
surface temps. from Balmer lines 48
Schuster problem 54
stellar atmos., "planetary nebula" problem 55
HD 190 073 Balmer discontinuity 1590
Doppler broadening by turbulence and interstellar clouds 2319, 2336
late F- and early G-type distinction 2351
turbulence and growth curve 2352
λ4430 interstellar band 3293
CH molecule 4 300 Å band intensity in F, G, K and M types 3295
white dwarf effective temp. det. 4061
early-type, interpretation 4064
spectroscopic parallaxes appl., survey 6001
CH bands invest. 6701
sub-dwarfs, spectrophotometric study 6706
Ca and H absorpt. lines equiv. widths, near i.r. 6708
3 metallic-line stars, spectrophot. study 7483
models for B-type stars 7486
lines formation 7487
type-lines, blanketing effect 7488
A-stars line-widths freq. dist. 7491
Balmer discontinuity for "extended-atmosphere" stars 7494
TiO γ-system rotational anal. 7685
interstellar matter continuous absorption 8443
solar atomic lines, 3-μ region 8461
H lines luminosity effects in O-type spectra 8479
striking line profile differences 8480
novae
EV Scuti 1949 8474
variable stars
spectr. res. of close binaries 5997
sun see also *Sun, radiation*
i.r., recent advances 37
chromosphere and prominences, intensity calc. 813
9–10 μ, improved map 814
wavelength shift interpretation 2326
Doppler broadening by turbulence 2336
H, Paschen and Brackett series 2337
2 943-cm^{-1} line invest. 3286
grating map, 3·0 to 5·2 μ 5034
radiation press. effect 5991
electrophotometrical invest. 5994
water vapour absorption lines, 8 μ to 13 μ 5995
granules radial vel. interpretation 6694
line equiv. widths and microturbulence 6695
growth curve for Cr I lines 6700
CH bands invest. 6701
CH$_4$ in earth's atmos., invest. 7405
atomic lines prediction, i.r. 7472

A complete list of the Subject Headings will be found at the end of the Index.

Astronomical spectra—*contd.*
sun—*contd.*
Fraunhofer lines, intens. distrib. 7473
new coronal line, 5 445 Å 7474
blanketing effect and photosphere struct. 7488
atomic spectra data, survey 7675
absorption change to emission at extreme limb 8459
chromospheric eruptions spectrophotometry 8460
atomic lines in 3-μ region 8461
continuous spectrum disappearance in flash spectra 8462
Tc in sun 9241
faint Fraunhofer lines, limb effect 9242
He excitation in chromosphere 9243
line contours in anomalous region 9244
corona, prominences
chromosphere, photospheric radiation effect 56
emission fluctuation 57
spectrophot. classif. of prominences 3285
H_α and D_3 polarization 5032
radial distrib. of corona emission 5993
Atmosphere see also *Ionosphere*
of planets and satellites 25
radioactivity, photographic emulsion meas. 1264
solar radiation absorption calc. 3971
composition, temp. and density, review 3972
scale height variation 3978
microwave refr. index studies 4003
upper, rockets invest. 6624
infrared radiation, meas. 9194
composition
T content 761
isotope separation by settling 1259
water vapour, photochemical dissoc. 1534
use of rockets to vary Na 2226
He^3 problem 3232
measurement, review 3965
upper levels, reviews 3972, 7460
O_3, vertical dist. 3975
variation with height, diffusion 3981
O_3 vert. dist. by lunar eclipses 4918
absence of ethylene 4919
isotope diffusion sep. below 55 km? 5683
A^{40}, age deduction 5936
free air radioactivity invest. 5941–3
O_3 vertical dist., India 6621
evolution 6622
A origin 6623
rocket invest. upper atmos. 6624
upper, H and He excitation 6645
upper, lab. study 6646
upper, aurora and twilight spectra study 6647
O dissoc., self-consistent treatment 7404
CH_4 abundance and vert. dist. 7405
effect of vegetation evaporation 7416
O_3, observations and photochem. 9203
new radioactivity studies 9221
quantitative det. by infra-red spectra 9386
stratosphere, variations 9846
K radioactivity and related problems 9190
humidity see also *Humidity*; *Rainfall*
high alt. radar-sonde system 2196, 9192
automatic hygrometer for upper air 2200, 9200
vertical distribution near ground 2212
microwave refr. index studies 4003
water vapour dist. in stratosphere 4936
ionization see *Atmospheric electricity*; *Ionization, atmosphere*; *Ionosphere*
movements see also *Weather forecasting*; *Wind*
general circulation, dynamics 1539
jet stream, geostrophic departures 2208
polar vortex studies 2209
turbulence spectrum and star scintillation 2219, 4948
potential grad. rel. to turbulent exchange 2227
general circulation, eq. 3362
diffusion processes invest. 3981
drift of sporadic *E* 4920, 6628–9, 8377
lower stratosphere, heat transfer 4925
general circulation, survey 4926–7
av. planetary circ. in meridian planes 4928
atmospheric turbulence, disc. 4929
circulation pattern from temp. trends 4934
lateral turbulence 6637

Atmosphere—*contd.*
movements—*contd.*
winds and turbulence, upper atmos. 6638
vertical and horizontal conc. of momentum 6639
rotation law invest. 6718
oscillations, thermal excitation 7411
dynamic eq., appl. to spherical co-ordinates 7412
waves associated with vortex discontinuities 7413
cumulo-nimbus descending current formation 7414
interaction between tropical and temperate 9206
meridional energy eddy flux 9207
angular-momentum balance, hemispherical study 9208
billow clouds formula 9215
semidiurnal tidal oscillation 9851
structure
upper atmosphere, nomenclature 1535, 2201, 3973–4
"Stockwerk–Gliederung" method 2206
stratosphere, i.r. lines pressure broadening data 2210
humidity vertical dist. near ground 2212
earth's gaseous tail hypothesis 3233, 5991
twilight phenomena, theories 3236–7
O_3 vertical dist. 3975, 6621
origin of ionospheric layers 3980
radio duct formation 4005
micrometeorites theory, heterothermal atmos. 5019
zodiacal light and outer atmos. 5020
rocket invest. upper atmos. 6624
upper atmos. exploration by meteors 6625
optical soundings, lunar eclipses appl. 6648
optical sounding, using twilight phenomena 6649
e.m. wave reflection, troposphere sounding appl. 7128
solar X-rays and u.v. invest. 9202
noble metals, electron configuration 9623
metallic Cu, outer electron configuration 9645
nomenclature 9845
temperature
upper atmosphere, spectroscopic meas. 532
radiative heat transfer near ground 1540
upper atmos. nomenclature 1535, 2201, 3973–4
radar-sonde system upper air meas. 2196, 9192
spectral line press. broadening 2210
higher layer, from twilight arc 2211
upper levels, review 3972
ionospheric layers thermal separation 3980
rel. to meson production 4496
lower stratosphere, thermal state 4925
O_3 and NO layers, radiation temp. 4931
changes in troposphere due to radiation 4932
upper atmos. var. 4933
trends of past century 4934
climatic var., deep-sea cores invest. 4935
radiation clouds formation 6620
upper atmos., rocket invest. 6624
ionospheric, review 7409
thermal excitation of oscillations 7411
effect of vegetation evaporation 7416
nocturnal radiation 9220
upper atmos., theory 9850
thermodynamics
global energy balance 4924
energy balance equations 9205
interactions tropical and temperate latitudes 9206
Atmospheric acoustics
ultrasonic absorption, humidity effect 1676
sound propagation in clouds 2215
Helmoltz waves 2235
acoustic wave propagation, review 2236
compressional wave propag., diffraction effects 4006
long-range sound prop. 4007
fog sound absorption 7639
Atmospheric disturbances see *Thunderstorms*; *Weather forecasting*
Atmospheric electricity see also *Aurora*; *Ionization, atmosphere*; *Ionosphere*; *Lightning*; *Thunderstorms*
ionized air current, effect on earth's field 1527
troposphere, dielectric const. var. with height 1948
diurnal and seasonal variations 2227
radio-atmospherics waveguide 2863
atmospherics use in v.l. radio waves study 2864
potential grad., effect of town buildings, etc. 3995
current in thunderstorms, effect on earth's field 3996
charge on raindrops 3997, 9862

Atmospheric electricity—*contd.*
  microwave refr. index studies 4003
  atmos. field, glider meas. 4914
  statistical action on recorder 5945
  ionospheric current systems, diurnal var. 6615
  fields strengths recording 6650
  upper atmos. conductivity from geomag. var. 6651
  high and variable resist. meas. app. 6652
  ionospheric currents, rocket invest. 7398
  tape recording of field charges 7421
  e.m. wave partial reflection troposphere 8063
  abnormal u.h.f. wave refraction 8064
  upper-air currents, rocket invest. 8370
  portable electrometer, radiosonde appl. 8375
  new radioactivity studies 9221
  charges on aeroplane in thunderclouds 9854
  distrib. in thunderclouds 9855–6
  charge passing to ground through thunderstorms 9857
  precipitation particles charges 9860
  charges from nine layers 9861
Atmospheric optics see also *Night sky*; *Sky brightness*; *Sunlight*
  i.r. transmission investign. 190
  spectral energy distribution 762
  star scintillation and turbulence spectrum 2219, 4948
  sky-light polarization, spectral dist. 2221
  vapour and ice particles, light scattering 3235
  reflection in fog 3238
  water vapour absorption, near i.r. 3445
  sky radiation, u.v. rel. intensity 3982
  turbid atmosphere i.r. transmission 3987
  transmission in 1- to 14-μ region 3988
  scattering by haze and ice particles 3989
  marginal refraction in ice clouds 3990
  radiation and absorption in various layers 3991
  N_2O absorption band 3994
  emission spectra, earth's surface, troposphere, and stratosphere 4931
  star scintillation photoelectric study 4947
  special sky scattering regions 4949
  sky colour and brightness 6643
  optical sounding, lunar eclipses appl. 6648
  blue sun (Sept., 1950) 7418
  sky brightness and polarisation, 18 000 ft to 38 000 ft 7419
  earth shadow study 8381–2
  u.v. transparency, anomalous 9210
  sun's light, scattering 9216
  light scatt. coeff., large particles 9217
  rainbow light, polarization 9218
  Airy's rainbow wave front eq. 9219
  scattering, review 9847
Atmospheric pressure see also *Barometers*
  high alt. radar-sonde system 2196, 9192
  rocket invest 6624
  ground press. rel. to ionosphere electron density 9204
  semidiurnal tidal var. 9851
Atomic beams
  polarized, metastable H atoms, production 554
  secondary emission of electrons from Mo 1319
  Ga and In nuclear moment discrepancies 1977
  H and D hyperfine structure 2155
  source for h.f.s. invest. 2927
  H, electron-loss cross-section in H_2 5503
  h.f.s. structure observation 7188
  optical representation with neutral atoms 7287
Atomic mass see also *Isotopes*; *Mass spectra*
  S^{32} 1256, 4618–19
  Al and S, reaction and mass spectrometric discrepancies 2040
  rel. to heavy nuclei track thinning 2279
  He isotopic weight 4598
  H^1, C^{12} 4619
  secondary standards det., H_2–D difference 4620
  mass doublets, mass spectrometer det. 4621
  Ge, Si and S, microwave study 4622
  new measurements and magic numbers evidence 5675
  Cl^{35}/O^{16}, special relation 5676
  S^{35} from OCS spectra 5677
  Al, Si, P and S isotopes 6397
  H^1, D^2, C^{12} and other light atoms 6398, 8149
  $Kr^{82, 84, 86}$ and $Xe^{129, 132}$ 8150
Atomic mass—*contd.*
  mass differences, CH_4–O, CH_2–N, CH_3–N 8151
  light nuclei, from disintegration energies 8152
  Cl^{39}, from (γ, p) cross-section meas., A^{40} 8908
  29 stable nuclides, new values 8909
Atomic weight
  rel. to alpha-particle stopping power 1141
  rel. to heavy nuclei track thinning 2279
Atoms see also *Elements*; *Nucleus*
  diameter, rel. to optical rotation 555
  A, mutual repulsive potential 556
  He, repulsive potential 557
  single, electron microscope visibility 1101
  light, auto-ionization probability 1252
  radii, correl. with ionic hydration heat 1254
  H electron scattering, variational invest. 3572
  charge exchange with ions 3577
  atomic radii in Co_2Al_9 3927
  magnetic shielding field 4613
  triple-dipole interactions 6376
  ditto, rare gas crystals 6373
  C atom electron affinity 6393
  stopping power of K-electrons 8140
  empirical relations of ioniz. pot. 8905
  line strengths, ionized Ne 9644
 excitation
  Hg excitation energies, arc spectrum det. 943
  Gd, arc and spark spectra 944
  A–Hg disch. radiation, metastable atoms role 1079
  O metastable states, by electrons 1137
  He, h/e determination 1138
  metastable atom formation in Hg vapours 1733
  electron impact, Born, Oppenheimer approx. 1890
  electron-bombarded Cu film 2751
  resonance state life-times det. 2929*
  Li resonance states, lifetime 2930
  H discharge, decay mechanisms 3541
  ditto, Rayleigh afterglow 4406
  metastable H atoms, detection 3708
  ditto, production 554
  ditto, effect of electric fields 3710
  Be^9 excited states 3712
  canal-ray polarization, values calc. 4457
  metastable pairs collision, ionization 5504
  beta-decay, orbital perturbation 5674
  excited and ionized gases in equilib., entropy 6189
  excit. temps in H arc 6246
  lifetimes of Na, K, Rb, Tl states, meas. 6394
  influence of shell on nuclear ang. correl. 6444–5
  H and He, upper atmos. 6645
  excitation temp., spark disch. 6835
  metastable states, magneto-optical study 7139
  spectral data for astrophys., survey 7675
  H^- doubly excited state 8139
  light scatt. by bound electron 8148
  metastable A atoms in discharge 8753
  by electron collisions 8902
  Szilard–Chalmers process review 9778
 magnetic moment
  ferromagnetic alloys 560
  effect on spectra 1253
  internal diamag. field, Hartree computation 1984
  magnetic, in alloys of Mn with Ni and Co 3627
  ordered and disordered states, ferromag. alloys 3630
  Fe transition group spin-spin interaction 3634
  g values for K and H 8145
  electron gyromagnetic ratio 8146
  "compensated" elastic-ring balance 8906
  Fe, Co, Ni 8907
 structure see also *Nucleus*; *Spectra*
  Th III levels 180–1
  Si 533
  of configurations d^4p, d^5p, d^6p 549
  f^n configurations, structure 550–1
  l^r configuration, multiplet separation 552
  f^4 configuration multiplet separation 553
  H, D, fine structure 554, 3708, 7679
  ditto, effects of nuclear motion 3706, 7189, 8138*
  multiplet separation factors calc. 1248
  screening factors in isorows 1250
  ionization potentials est. 1251
  g-value changes with mag. field 1721
  Ne III self-consistent field 1983

Atoms—*contd.*
  structure—*contd.*
    int. diamag. field, Hartree computation 1984
    Li ground state, wave function 1985
    inverted alkali doublets 2507
    VI and CrII deep configurations 2508
    Cu^{++} h.f.s., ang. dependence 2512
    metallic Li resonance shift 2524, 4256
    H^3 hyperfine structure 2926
    Mg I, wave functions and transition probabilities 2928
    shell structure and secondary electron emission 3707
    Lamb shift, Bethe approx. 3709
    positronium 5380, 8904
    Thomas–Fermi–Dirac eq., soln. 5652, 8135–6
    spin–spin interaction 5673
    h.f.s. levels in magnetic field 6319
    rare-earth elements, atomic heats 6395
    Fe transition group, h.f.s. of paramag. resonance lines 7089
    h.f.s. by atomic beam method 7188
    Ni^{++} ground state splitting in Ni fluosilicate 7190
    Cr and Ni absolute oscillator strengths 7191
    oscillator strengths calc. 7192
    Na electron affinity calc. 7193
    atomic binding energy calc. 7194
    d-shell interaction 7195
    ditto, transition metals 4616, 5670
    Schrödinger integrals, many-electron atoms 7196
    ditto, antisymmetric vector-coupled functions 7197
    positronium wave equation 7561
    H, recent spectrum discoveries, review 7676
    nuclear effects in spectra, review 7677
    heavy H α-line fine struct. 7680
    H and singly ionized He, anomalous fine struct. 7682
    positronium, fine structure 8112
    Thomas–Fermi function for packed atom 8137
    Te II 8141
    Mn II configuration interaction 8142
    Stark-levels, non-adiabatic transitions in H 8147
    ionized Li, wave function 8903
    K level of Hg from X-ray spectra 9512
Aurora see also *Night sky*
    quadrupole transition probability 537
    O excitation and de-excitation probabilities 1137
    corpuscular origin, review 2204
    airglow studies 2220
    lines and bands 3 100–5 000 Å 2223
    protons entry into upper atmos. 2231, 4001
    i.r. spectrum, new N_2^+ bands 2232
    auroral arc and luminous clouds 2233
    electrodynamics, appl. textbook 2309
    magnetic fields and fluid conductor motion interactions 3223
    i.r. spectrum, new N_2^+ band system 3239
    model experiment 3998
    N and S hemispheres, correlation 3999
    Doppler-shifted Hα line 4000
    57-keV proton entry during activity 4002
    h.f. reflection 4004
    N bands excitation functions invest. 4954
    proton approach velocity 4955
    v.h.f. propagation phenomenon 6367
    H and He excitation, upper atmos. 6645
    upper atmos. physics, lab. study 6646
    spectral analysis in upper atmos. study 6647
    rel. to geomagnetic variations 6651
    spectra showing broad H lines 6654
    rel. to increased cosmic-ray intensities 7055
    spectrum, review 7420
    50 Mc/s abnormal propag., interpretation 7422
    forbidden N emissions 7423
    spectrum from 6 200 to 8 900 Å 7424
    magnetic storms theory 8371/2
Avogadro's number
    of imperfect crystals 3904
    from Rayleigh scattering in gases and liquids 5327
Balances
    rectified r.f. appl. 1464
    electric micro-balance 2404
    torsional, suspension strips 5135
    microbalance technique, review 7578
    vacuum torsion, dielectrics sorption meas. 8542
    chemical, adaptation for precision weighing 9292
Ballistics see also *Impact*; *Projectiles*
    space-rocket trajectories 102
    rocket motors, flow stability 103, 6051
    Kerr cell camera and flash unit 776
    powders, burning rate at h.p. 1012
    rocket speed limit? 3351
    fragment velocity after penetration 3352
    long-range rockets, accuracy 5137
    penetration by high-velocity jets, 5138–9
    contribution to meteorics 5985
    high alt. missiles, temp. barrier 6049
    rocket trajectory, perturbation calculus 6762
    orbital rockets, design problems 6763
    cross-wind effect on projectile 7575
Barium
    thin film, photo-adsorption 1119
    evaporated film, N absorption 1346
    nickel mixtures, sec. electrons 2754
    getters, efficiency 6786
Barium nitrate
    elastic constants 1478
Barium oxide
    l.p. equilibrium in redn. by C 1387
    photoelectric changes due to u.v. irradiation 1845
    enhanced photoelectric emission effect 4390
    thermo-e.m.f. 5425
    growth of crystals from vapour 7377
    absorption and photoconductivity 7693
    low freq. dielectric constant 7837
    semiconduction and photoconduction 7884
    photo conductivity and photoemission 7898
    evap. products from various base metals 9567
Barium stannate
    ferro-electric solid solutions 9443
Barium strontium oxide
    thermal conductivity 2600
    thermo-e.m.f. 5425
Barium tartrate
    new ferro-electricity theory 302
Barium titanate
    review of research 300
    ferroelectric properties, O displacement theory 1042
    and its solid solns., d.c. resistance 1828
    h.f. dielectric losses 2673
    ceramic, electromech. oscillations 2677
    single-domain crystals, electromech. behaviour 2678
    dielectric constant 3512
    conductivity discontinuities 3517
    low temp. twinning 3903
    temporary hysteresis enhancement 4367
    $BaO–TiO_2$ phase diagram 4813
    ultrasonic transducer, large motion 5200
    ferroelectricity, X-ray invest. 5389
    Ba–Sr titanates diel. props., pressure effects 5390
    Ba–Pb titanates, diel. and thermal props. 5395
    low-temp. diel. props. 5396
    dielectric permittivity 6197
    volume change at 3 transitions 6202
    acoustic transducer appl., hearing aids 6808
    polarisation invest. 6945
    single-crystal, elastic and electromech. coupling 6956
    electrostatic. induced permanent memory appl. 7838
    hexagonal, Lorentz correction 7841
    noncubic high temp. phase 8334
    domain structure and ferroelectric state invest. 8711
    new varieties of monocrystal 9807
Barium zirconate
    ferroelectric solid solutions 9443
Barometers
    review, bibliog. 3965
    new Hg type reading system 6073
    cistern and fixed scales, thermal correction 6781
    recording microbarometer 6782
Beats
    intensity meas., best beats method 4210–11
    light "beats" 9395
Bending see also *Stress analysis*; *Torsion*
  beams
    defl. of cantilever strut 6045
    elastic-plastic bending 9290
Benzene
    Raman spectra and heat cap., low temps. 978
    intermolecular forces 2889, 4579

A complete list of the Subject Headings will be found at the end of the Index.

- **Benzene**—*contd.*
  - tensile strength 4136
  - viscosity at const. vol., varying temp. 5142
  - quadrupole moment 5281
  - crystalline, entropy calc. 5375
  - relaxation, acoustic meas. 6078
  - limiting negative press. 6768
  - complexes with oxalyl chloride 7699
  - droplets, light scattering 7785
  - X-ray diffraction exam., temp. effect 8251
  - electrical strength 8756
  - vapour, 200 kV electron diffraction exam. 8771
  - A_{1g}–E_{1g} transition 8874
  - in CCl$_4$, optical anisotropy 9402
  - solution in CO$_2$, at critical point 9424
- **Benzoin**
  - rotatory power 240
- **Berkelium**
  - discovery and investigation 2949
- **Beryllium**
  - de Haas–van Alphen effect 488, 3624, 9601
  - allotropy 753
  - examination under polarized light 4302
- **Bessel functions**
  - zeros evaluation, new method 6
  - appl. to mag. field dist. 3558
  - Coulomb wave functions calc. 5131
- **Beta-ray spectra** see also *Radioactive disintegration theory*
  - electron conversion of gamma quanta 591
  - allowed, theory review 2014
  - light nuclei β-decay constants 2911
  - complete reference tables 2938, 6402
  - shapes investigation 2976
  - new high $(H\rho)$, electron-producing particles 4658–9
  - shape, and window correction curves 4661
  - Fermi function calc. 4665
  - first forbidden shape factor and $f_n t$ products 4666
  - μ-meson decay 6476, 9718
  - neutron decay 7205, 9009
  - β-decay spectra, table 7209
  - energy dist. from absorption meas. 7320
  - forbidden, cross-correction factors 7233
  - relative phase for mixed invariants interaction constants 8172
  - forbidden, theory 8173
  - effect of neutrino spin 8938
  - review 9668
  - recoil spectrum meas. 9670
  - RaD conversion and Auger electrons study 9679
  - A^{39} 586, 3012
  - Ag$^{110-11}$ 595, 6430, 6432
  - Ag^{106} 24-min radiations 8922
  - Am isotopes 565, 1992
  - As$^{74, 77}$ 3736, 4648, 5701
  - Au$^{198-9}$, secondary 2985, 3728, 8928
  - B$^{8, 12}$ 2003, 6415
  - Ba^{140} 8926
  - Br$^{77, 80, 80-4}$ 3731, 3738, 6423, 8936
  - C$^{14, 15}$ 1282, 2041
  - Ca^{45} 2967, 6429
  - Cd$^{113, 115}$ 2968, 6408
  - Ce$^{133, 141, 143-4}$ 571, 2948, 8170, 8929
  - Cl$^{34, 36, 39}$ 1996, 2972, 6425, 6428, 8169
  - Co^{60} 1281, 6429
  - Cs^{137} 2019, 5716, 7213
  - F$^{17, 18, 20}$ 2005–6, 2947, 8169
  - Ga^{66} 2959
  - Gd isotopes 567
  - H^{3} 564, 2946, 8165
  - Hf isotopes 2004, 7219
  - Hg^{203}, new method 8157
  - Ho isotopes 568, 3728
  - I$^{122, 126, 131}$ 4647, 4663, 5705*, 6412, 8933–4, 9655, 9661
  - In$^{108-10, 115-16}$ 587, 2945, 4652
  - Io → Ra 4683
  - Ir isotopes 566, 5708
  - K^{40} 6410–11, 9667
  - Kr$^{79, 83, 85, 89-91}$ 572, 580, 4651, 5700*, 6424, 7206
  - Kr, new activity 569
  - Kr^{89}, β-recoil 5717
  - La$^{131-2, 134, 140}$ 2948, 5704, 9672
- **Beta-ray spectra**—*contd.*
  - Lu^{177} 3728
  - Mo^{99} 2973, 4642
  - Na^{24} 7210
  - Nd$^{138-9, 147}$ 2948, 6409, 6431, 7218, 8170
  - Ni$^{57, 63}$ 1274, 4645, 8936
  - Np^{236} 6420
  - Os$^{185, 191, 193}$ 588
  - Os, 15-day 5714
  - P$^{32, 33}$ 2011, 8914
  - Pa^{233} 571, 1280
  - Pm$^{145, 149}$ 4654*, 6409
  - Pr$^{138-9, 142-4}$ 2943, 2948, 8170, 8929
  - RaC 3733
  - Rb$^{86, 88, 90-1}$ etc. 2942, 2974, 2978, 5700*, 5713, 7206
  - Re^{186} 5707, 7212
  - Rh^{105} 3731
  - Ru$^{103, 105}$ 570, 3731
  - Sm^{145} 4654*
  - S^{35} 2012, 8932
  - Sb$^{120, 124}$ 590, 2939
  - Sc$^{44, 46}$ 584, 1269, 4662, 6407
  - Se, new isomer 576
  - Sn$^{117, 119}$ 595
  - Ta^{181m} 2004
  - Tb$^{153-7}$ 568
  - Tc^{99} 2973, 4660
  - Ti^{45} 1997, 4643
  - Tl^{206} 7226
  - Th^{233} 1998
  - Th, radioactive deposit 6426
  - Th($B + C + C''$), F, I and L lines abs. det. 8930
  - ThD internal conversion 7227
  - UX$_1$ and UX$_2$ 2966
  - UY(Th^{231}) 5706, 7229
  - Xe$^{131, 133, 135}$ 581, 1276, 2000, 6424, 8933
  - Zn^{65} by absorption 6429
  - Zr^{89} etc. 5715, 7214
- **Beta-ray spectrometers**
  - thin magnetic lens, ring focus 365, 4440
  - magnetic focusing coincidence type 367
  - spiral orbit, theory and use 1099–100
  - ditto, with 2 radii 5461*
  - anthracene as low-energy detector 1127, 2766
  - non-unif. transverse magnetic 1867
  - double focusing, spherical aberration 2733
  - ditto, wedge-shaped fields 4431
  - ditto, circumferential yoke 7937
  - lens type, optical system 2734
  - ditto, unified theory 3563
  - ditto, neutralization of earth's field 4441
  - ditto, transmission curves, graphical det. 4442
  - ditto, source discharger 5462
  - ditto, annular exit slit 8933
  - double-lens, theory 2736
  - electrostatic, radial collection 2737
  - spheroidal mag. field 2738
  - reviews 3561, 8166, 8168, 9668
  - double thin-lens type 3562
  - ketron, improved focusing mag. spectrometer 4427
  - C^{12}(n, $2n$)C^{11} in anthracene, possible appl. 5809
  - inhomog. mag. field, 3-dim. dist. 6258
  - semicircular focusing, improvements 6426
  - helicoidal, diaphragm disposition 7014
  - calibration of field with proton mag. resonance 7227
  - auxiliary equipment for bombarded gases 7232
  - mag. field vector potential expressions 8768
  - automatic operation 9525
- **Beta-rays** see also *Electron beams*; *Electrons*
  - evidence for magic numbers 539
  - β–γ angular correlation 589, 7228, 8937
  - ditto, Li^{8} 5703
  - ditto, Hg^{197}1272
  - ditto, Sb^{124} 8935
  - beta-emitting isotopes, statistical study 1283
  - positive-track-producing particles 1285
  - pos. particles near beta-emitters 1286
  - β–γ coincidences, Cd^{115} 1993
  - ditto, Cu^{64} 8167
  - sources in uniformly absorbing media 2009
  - kinetic energy conversion 2010
  - β-disintegration, abnormal radiation 2969
  - emission of neg. particle distinct from electron 3734

- **Beta-rays**—*contd.*
  - internal conversion, directional correl. 3753
  - electron beam polarization 4668
  - elec. and mag. field effect on polarized beams 4669
  - biological effects 4973
  - β-recoil expts., Kr^{89} 5717
  - from aligned nuclei, polarization 5720
  - interaction in β-decay 5722
  - electron-neutrino angular correlation 5723
  - elements unstable against β-decay 6387
  - internal recombination in β-emission 6427
  - action on space-charge-free diamond 7033
  - phosphorus-Bakelite sources 7225
  - weak betas, effect on elec. breakdown 7916
  - origin and props., elementary review 8166
  - K^{40}, coincidence of Auger electrons with γ-rays 9678
  - B^{12} 9662
  - C^{14}–N^{14} β-decay 2970
  - F^{17} 8931
  - Hg^{198} delayed coincidences 1267
  - In^{115} natural radioactivity 2945
  - K^{40}, intensity, rel. to X-ray intensity 2944
  - Li^{8} 9662
  - Na^{24} forbidden beta-decay 1284
  - Nb^{99} 1278
  - P^{32} neutrinos emission invest. 4667
  - Ta^{185} 1278
  - Tl^{202} 11·5-day 1271
  - **absorption** see also *Electron beams, absorption*
    - point source, absorbed energy dist. 1263
    - use in thickness meas. 2403
    - in nylon and formvar films 2748
    - self-absorption and backscattering 2971, 3735, 7231
    - energy-loss dist. in Al 5466
    - elementary review 8166
  - **measurement** see also *Beta-ray spectrometers*; *Counter tubes*; *Counters*; *Radiation monitoring*; *Radioactivity measurement*
    - emission rate, abs. det. 593
    - calorimetric, of P^{32} source 1262
    - from radio-isotopes 1287
    - solid low-energy emitters 2013
    - review 3555, 8166
    - photosensitive G.M. counters 3582
    - sewage effluent, evap. method 4012
    - survey of techniques 5684
    - dosages above 1 rep./sec., rapid method 5719
    - absolute counting 7198
    - soft, in air, survey-meter 7968
    - coincidence meas. Nd^{147}, Ce^{144}, Pr^{144}, Ce^{143} 8170
    - dosimetry, review 8405
  - **scattering** see also *Electrons, scattering*
    - P^{32}, multiple scattering in Al 3570
    - difference from electrons 4443
    - on atomic electrons, 0·6–1·7 MeV 6260
    - scattering anomaly 6261
    - back scattering expts. 7940
- **Bibliographies**
  - diatomic molecular spectra 2502
  - polarography 3179, 3885
  - discharge physics 3535
  - electron microscopy 3811
  - ion exchanges 3853
  - automatic chem. analysis 3884
  - potentiometric analysis 3886
  - radioactive chem. analysis 3891
  - spectrochemical analysis 3893–5
  - X-ray absorption chemical analysis 3896
  - chromatography 3897
  - meteorological measurements 3965
  - high-speed photography 4989
  - ultrasonics (1926–50) 6088
  - extraterrestrial radio noise 7456
  - sonic and ultrasonic vibrations, biol. appl. (1900–50) 7637
  - atmospheric O$_3$ 9203
  - electric dipole moments (1919–46) 9442
  - cyclotrons 9534
  - high-voltage d.c. generators 9535
  - β- and γ-ray spectroscopy 9668
  - neutron scattering by crystals 9734
  - Szilard–Chalmers process 9778
  - radiation in atmosphere 9847
- **Binary stars**
  - colours and magnitudes, photoelectric det. 816
  - spectroscopic, component, magnitude differences 3288
  - mass-luminosity rel. from spectroscopic binaries 3294
  - formation theory 4055
  - formation, planetary system origin theory 5014
  - spectr. resol. of close binaries 5997
  - equilib. figure study 6705
  - eclipsing, reflection effect 6713
  - components, magnitude differences, visual det. 7475
  - closed, intermediate atmospheres 7490
- **Biological effects of radiation** see also *Radiotherapy*
  - cell reactions, math. theory 768
  - low-intensity radiation, cytological effects 1548
  - ultrasound effect on living systems 1684
  - protection, humans and animals, review 1986
  - bioelectric potential as injury meas. 2237
  - 20 MeV X-rays, biol. dosimeter 3246
  - Int. Commission recommendations 3554, 4013, 5958–9, 8399, 9877
  - ionizing radiations, mode of action, conf. 4008
  - cyclotron workers' blood 4009, 8403
  - various modes of action, analysis 4973
  - atomic energy hazards 4974
  - electric conductive and dielectric studies, animal tissue 4976
  - ultrasonic, amplitude duration relations 5189
  - protective drugs 6664
  - lateral distrib. of ions across particle track 7043
  - chemical dosimetry 7200
  - recovery from radiation injury 7433
  - cavitation and haemolysis by ultrasonics 7630, 8601
  - cell resonances, audible freq. 7632
  - sonic and ultrasonic vibrations, bibl. (1900–50) 7637
  - effects on man in space 8388
  - survey (1949) 8398
  - powerful acoustic transducers 8599
  - symposium 9775
- **Biological technique and instruments**
  - l.v. microspectrometer 179
  - wet tissues, electron microscopy 1358
  - differential rectocardiograph 1549
  - ultrasonic diagnostic methods 1677
  - interferometer microscope 1785
  - beta sources in absorbing media 2009
  - continuous flow respirometer 2239
  - betatron in cancer therapy 2263
  - ultrasonic intracranial pathology detection 2266
  - high-intensity X-ray beams, appl. 2722
  - impulse generator for electrophysiology 3245
  - photo-electric nephelometer 3468
  - 180° mass spectrometer 3576
  - directional scint. counter 3590
  - ionizing radiations, conf. 4008
  - hypodermic press. manometer 4133
  - wide-range mechano-electronic transducer 4200
  - circulatory haemoglobin continuous recording 4957
  - automatic manometric respirometer 4959
  - expired air partitioning app. 4978
  - *in vivo* radioactive tracer meas. 5946
  - membrane manometer 6053
  - progress review 6655
  - ionization chambers for electron dosimetry 7031
  - scintillation-counter brain needle 7037
  - brain tumour localization with radioisotopes 7437
  - dose distrib. calc., rotating irradiated bodice 7438
  - microspectroscopy fixed and living cells 7663
  - self-recording microspectrography 7664
  - tissue and cell structure, X-ray and u.v. absorption methods 7926
  - quantitation of α emitters in bone 8154
  - sterilization appl. of fission products 8216
  - radioactive subst., cancer diagnosis and therapy 8404
  - electron microscope replicas prod. 8252
  - artificial radioelements appl., survey 8325
  - amplifier for retina voltage meas. 8387
  - skin conductivity and temp. meas. 8389
  - electronic flicker app. 8391
  - phosphors for erythema lamps 8647
  - optical methods in cytology, review 8672
  - scintillation counter 9551
  - radio. isotopes activity and turnover errors 9652

A complete list of the Subject Headings will be found at the end of the Index.

Biological technique and instruments—*contd.*
- P^{32} solutions, particulate impurity 9653
- mass spectrometer analysis, respiratory metabolism appl. 9864

Biology see also *Electrobiology*; *Medical science*; *Physiology*; *Zoology*
- size, shape, hydration of viruses 7426

Biophysics
- bioelectric potl. as radiation injury meas. 2237
- brain injuries, fluid sphere shock invest. 4016
- gene molecules, quantum-mech. forces 5638
- progress survey, coll. papers 6655

Birefringence see *Double refraction*

Bismuth
- large mag. field meas. appl. 2819
- magnetoresistance at 3 000 Mc/s 2877
- elect. resist., change in strong mag. field 4562–3
- thermoelectric props. 5426
- crystals, resist. change in mag. field 5620, 8076
- crystals, twinning 7373
- films, thermoelectric power 9498
- infl. of mag. field on crystallization 9808

Blood
- cyclotron workers, unusual phenomenon 4009
- circulatory haemoglobin continuous recording 4957
- radioactive tracer invest., math. interpret. 4958
- electric conductive and dielectric studies 4976
- human, diel. behaviour at microwave freq. 9879

Boiling see also *Distillation*
- boiling heat transfer study 7805

Boiling point
- ortho-deuterium 3485
- H isotopes 4333
- elements, rel. to melting points 9419

Bolometers
- quick-acting type 922
- thermocouple, wire, sheet, and scale types 2488
- low temp., free radicals beam detect. 4758
- absolute radiometer 5225
- glass film 7651
- effect of modulated light 9354

Bonds see also *Molecules*
- non-adjacent atoms 534
- C–Br, dissociation energy 535
- localization energy 719
- quantum-mechanical resonance 720, 3169
- C–Cl in HCCCl and DCCCl 960
- moments in C_2N_2 and CClN 961
- electron interaction integrals, diatomic mol. 1218*
- force constants and frequencies, alternating cyclic chains 1220
- naphthalene, vibration spectrum evidence 1222
- weak, in adsorption theory 1409
- chemisorption heat calc. 1415
- resonating, in $B_{10}H_{14}$ 1500
- in intermetallic compds. 1958
- in catalysis theory 2125–6
- overlap integrals 2147
- thiophthen, central bond length 2184, 3881
- H, vibration spectra 2561
- formation, inner electron shell disturbances 2890
- homopolar, in H^1 molecule 2896
- dodecahedral octacovalent orbitals 2898
- C–Br dissoc. energy in trichlorobromomethane 2902
- dissociation energies, factors influencing 3170
- hydroxyl, and ultrahertzian absorption 3513
- Ge–H, av. binding energy 3597
- hardmetal structure theory 3680
- non-planar vibrations, subst. ethylenes 3691
- consonant electron systems 3692
- H, neutron scattering invest. 3693
- conjugation in sulphones 3880
- double bond conjug., effect of substituents 4296
- heterocyclic comp., dipole moments calc. 4583
- hybridization and resonance in mol. structure 4591
- hexacovalent orbitals 4865, 4868
- C–H, polarity, field calc. 4866
- in trihalide and bifluoride ions, molec. orbital method 4867
- est. energies in C, N, O and H compds. 4869
- C–H, conc. rel. to hydrocarbon flame vel. 5357
- tripyramidal orbitals 5651

Bonds—*contd.*
- Coulomb and exchange integrals calc., polar struct. 5886
- C–Br dissoc. energy, halogenation effect 5887
- C–Br, dissoc. energy aromatic subst. effect 5888
- H, rel. to dye phosphors 5893
- C=C valence-vibration line intensity, hydrocarbons scattering spectra 6120
- covalency, electrovalency and electronegativity 6379
- lengths in conjug. molecules 6380
- hybrid orbitals for coord. nos. 7 and 9 6381
- dissoc. energies, conjugation effect 6523
- π-bonds, interaction intensity calc. 6547
- dissoc. energies det. 6548
- methylene, first C–H dissoc. energy 6934
- 2*s*, 2*p* hybrid orbitals bonding power 7152
- strengths, factors affecting, etc. 7157*
- ionic character 7158
- ionic-homopolar resonance 7159
- conjug. molecules, energies and bond lengths 7160
- π-bonds, heteronuclear mol., order/length rel. 7161
- lengths in naphthalene and anthracene 7162
- bond lengths in conjugated molecules 7163
- HF, dipole moment ionic character 7167
- orthonormal LCAO, forced hybridization 7169
- forbidden octacovalent structure 7172
- in trifluorosilane derivs. 7175
- C–H bond strength in neopentane 7349
- bond energies and lengths 7359
- OCS, CS_2, stretching vibrations 7694
- H, hydroxylic compds. i.r. spectra invest. 7705
- BN, i.r. spectra invest. 7749
- Penney bond orders, free valence defn. 8086
- solid Cl quadrupole spectrum 8091
- carboxyl group, invest. 8316–17
- C–C, interaction intensity 8318
- transition, orbital hybrid 8319
- *p*-nitroaniline and *p–d* nitrobenzene, thermal expansion invest. 8685
- solid long-chain alcohols 8722
- free valence in unsat. hydrocarbons 9093
- interactions in linear and angular molecules 9094
- dimethylberyllium 9178
- H bonds shortness in Ni dimethylglyoxine 9179
- spectrochemical quantitative anal. 9120
- C–H, absorption freq. and their perturbations 9372
- isostere structures comparison 9627
- C–H, C–C, dissociation energies 9629
- C–Br dissoc. energy in subst. benzyl bromides 9794
- C–Br, dissoc. energy in halogenated bromomethanes 9795

Boron
- estimation in Pyrex by neutron absorption 3182
- magnetic properties of cpds. 6327
- photoconductivity, charac. 6972

Boron carbide
- single crystals, preparation 3192

Boron trifluoride
- ionization chamber appl. 5492

Breakdown, electric see also *Discharges*
- u.h.f., mechanism 1074
- v. small inter-electrode distances 2712
- reaction and similarity principle considerations 2713
- spark, in air, formative time lags 2716
- h.f., cloud chamber study 3537
- over insulators in high vac. 5441
- insulator films, tunnel effects 5447, 9511
- over insulators in high vacuum 6250
- diel. gaps, weak betas effect 7916
- spark disch., review 7918
- in CO_2, l.p. to liquid state 8747
- gases
  - microwave freq., magnetic field effect 1075
  - h.p., +ve point-to-plane 1082
  - d.c., in compressed gases, electrodes influence 1083
  - plasma formation 1857
  - in long gaps, barrier influences 2714
  - breakdown-voltage/press. curves 3542
  - streamer, sparking thresholds 4400
  - lags in compressed N and H 5445
  - h.f., air, prior +ve-ion formation 6233
  - H, secondary ionization 6241

A complete list of the Subject Headings will be found at the end of the Index.

Breakdown, electric—*contd.*
  gases—*contd.*
    h.f., disch., similarity rel. 7920
    at contacts on closure 9507
  liquids
    Al conducting-bridge formation in vaseline 3550, 6248
    organic, pulse techniques 8756
  solids
    in dielectrics, mechanism 359, 6249
    Al_2O_3, high temp. 5446
    ceramics and glass 6952
    ionic crystals 8757
    in KCl and AgCl mixed cryst. 8758
    alkali halide cryst. 8759
    glass, pulse-time and temp. 8760
    rectifiers, temp. effect 9473
Breaking strength see also *Brittleness*; *Fracture*; *Mechanical strength*
  rate-process theory, glass appl. 683
  rupture mechanisms in metals 1366
  cylinders, h.p. apparatus 1386
  dislocation theory 2099
  brittle failure of Zn crystals 2108
  graphite, high-temp. 5833
  suture matls., meas. app. 5835
  quartz, ammonium dihydrogen phosphate 9353
Bremsstrahlung see *Electrons, radiation*; *Gamma rays*; *X-rays*
Brightness see also *Illumination*
  consequences of luminosities additivity 2245
  eye spectral sensitivity rel. 2249
  suprathreshold area relationships 4964
  relationships for comfortable seeing 4965
  black body W standard 5227
  fine detail, air photography 5969
  multi-stage fluorescence radiance amplification 6135
  dist. in strongly dispersing media 6150
  distribution in sea 6151
Brittleness see also *Breaking strength*
  brittle matl. flow and fracture 676
  brittle failure of Zn crystals 2108
  H effects in Fe and steels 3824
  polymers, tensile strength and brittle temp. 6514
Bromine
  zero-pressure thermodynamic properties 275
  vapour pressure meas. 4337
Brownian movement
  "velocity," defn. and observation 1628
  electrical noise analysis 3344
  osmosis in h.f. field 6069
  in gas of non-interacting molecules 7569
  of galvanometer 8588
  dipoles rotation piezoelec. loss interpretation 8725
Bubbles see also *Foams*
  surface tension and energy 113
  growth-rate in solutions 4159
  water-metal interface, sound absorption 5187
  atomic nucleus model expts. 5653
  in liquid-gas solutions, stability 2428, 4158
  stability on solid surface 3381
Butadiene
  electronic levels 5639
  CH_3-induced polymerization 6528
Butane
  C^{13}-substituted, mass spectra 4484
  adsorbed on silica, dielectric behaviour 8312
Cadmium
  diffusion rate in Cu 659
  electrode polarization mechanism 695
  crystals, surface effects in creep 1377
  Rehbinder effect, invest. 2112
  diffusion coeff. in Hg 3180
  de Haas–van Alphen effect 3624, 9601
  evapd. layers, elect. microscope exam. 3810
  liq. solns., thermodynam. props. 4356
  critical mag. field 6979
  inertia of electricity carrier 7848
  abs. energy loss of 18 MeV protons 7956
  infl. of mag. field on crystallization 9808
Cadmium iodide
  cryst. growth from aq. soln. 9125
Cadmium oxide
  electrical properties 5407, 6370, 7880
Cadmium selenide
  light-sensitivity range 2696
Cadmium sulphide
  natural Greenockite X-ray detector 390
  rectifier layer, X-ray invest. 1835
  light-sensitivity range 2696
  luminescence and conduct., α-irradiation effect 5298
  photoconductivity, low temp. 5415
  conduct. var. with electron irradiation 6220
  photoconductive, prep. 6223
  photoconductivity relaxation 6225
  powder, light absorption meas. 6878
  electron mobility, luminescence efficiency 6967
  ultrasonic absorption 7631
  droplets, light scattering 7785
  semiconductive layer, asymmetric illumination rectifier effect 7874
Caesium
  vapour, hot-cathode arcs 345
  Cs–Sb layers photoelectric emission 1062
  afterglows, electron-density and light-intensity decay 5443
  photo-ionization cross-section 8144
  eq. of state 8707
Caesium bromide
  crystals, transmittance 5266
Caesium chloride
  thermal transition, rel. to cryst. struct. 8356
  molecular constants 8642
Caesium titanium alum
  thermal and magnetic properties, low temp. 9603
Caesium iodide
  adsorption of gases 3872
  N_2 + CO and A + O_2 adsorption 3873
Calcite
  elec. props., rel. to temp. luminescence 3515
  crystal habit, electron microscope study 3812
  refract. index meas., 5–14 μ region 5236
  Raman spectrum, photometry 5305
  external frequencies and specific heat 8704
Calcium
  thermal ionization 7982
Calcium carbonate
  metastable phases formation 1488
Calcium chloride
  $CaCl_2 . 4H_2O$ crystals, optical constants 3187
Calcium fluoride see also *Fluorite*
  thermal conductivity 2599
Calcium titanate
  dielectric permittivity 6197
Calculating apparatus see also *Fourier analysis*
  for 1-dimensional Fourier summation 9
  calculating board errors 13
  curve computer 14
  resistance thermometer data calc. 270
  for X-ray-structure-factor calc. 751
  symbolic logic in computing programme 785
  procedures for aberrational and Eikonal coeffs. 931
  for Laplace's relation inversion 1581
  real numbers multiplication 2298
  representation of functions 2300
  information theory conference 2482
  % transmission computer 4034
  electronic computers, standard terminology 4036
  graph slope meas. instr. 5001
  cybernetics problems, general treatment 5003–4
  combination with real objects in dynamics 6048
  new Stieltjes integrator 6676
  electrical computing, standard methods 7451
  appl. to optical calculations 8613–14
  electronic wave nos. calc. 8621
  most efficient coding, information theory 9230
  device for electron scatt. phase shift anal. 9526
  analogue apparatus
    a.c. network, for simultaneous equations 10
    Laplace equations circuits, accuracy 12
    electronic pile simulator 630
    photoelectric, for correlation coeff. calc. 784
    for Fourier synthesis crystal structure det. 1496
    Venn diagram electronic computer 1565–6
    a multiplier 2297

Calculating apparatus—*contd.*
  analogue apparatus—*contd.*
    Anacom, new techniques 2299
    computing linear array aerials 2859
    Fourier analysis and synthesis computer 3258
    for differential equations 3259, 4035
    electronic graphical computer 3261
    simple photocell computer 3262, 6677
    network for eigenvalues, eigenvectors det. 4038
    linear filter study, optical method 4317
    for flame gas composition 4339
    Fourier series summation, optical method 5002, 8352
    computer for thermodynamic calc. 6937
    for crystal structure amp. 8351
    Fourier synthesis by optical interference 9142
  differential analysers
    periodic analysis of curves 787
    mechanical, Bush type 1567
    special accessories 3260, 5977
    electronic, for exploratory calc. 4033
  digital computers
    all-purpose digital computer 8
    binary computer, arithmetic operations 11
    electronic, programmed survey 783
    differential eq. soln. 786
    integration of diff. equations 1562
    BARK relay machine, arithmetical unit 1564
    electronic, arithmetical principles, survey 2296
    high-speed, experimental 2301
    3-dim. information storage 2302
    speech correlation function analysis appl. 2483
    N.P.L. automatic, pilot model 4037
    electromech. registers in radioact. counting 4134
    punched cards molec. structure det. appl. 4905
    programme preparation, survey 4999
    diagnosis of programme mistakes 5000
    programmed, circuits and operating principles 5976
    the California computer, CALDIC 6675
    universal, high-speed, serial computing circuits 7450
    punched card machines at Herstmonceux 8427
    projected electronic computer 8428
    EDVAC, functional description 9229
Calculation see also *Nomograms*; *Graphs*; *Interpolation*
    operators $F = \sum_{k=0}^{k=n} F_k(x)\left(\frac{d}{dx}\right)^k$, 2
    quantum-mechanical operators 3
    high-degree equations, grapho-analytical soln. 7
    gas flow in nozzle 135
    matrices of d^np configurations 549
    Gibbs adsorption isotherm integration 713
    fundamental eigenfunction det. 780
    wave equations, higher order 782
    aberration and Eikonal coeffs. 931
    matrix proper values and directions 1558
    step-by-step integration of diff. eqns. 1562
    boundary value problem, characteristic nos. det. 1563
    radial wave functions 2391
    irreg. Coulomb function, asymptotic expansion 2392
    non-linear oscillation, topological methods 2457
    complex numbers multiplication chart 3257
    atomic const., least-squares, new formulation 3308
    least squares, nonindependence considerations 3309
    Pt thermohm tables 3498
    linear regression, simplified 4029
    residual stress in wires 4792
    Raman shift in vacuum 5300
    matrix, numerical, systematization 5971
    factorization method for eigenvalue problems 5973
    Kepler's equation, nomograms 5975
    thicknesses alignment chart 6496
    crystal frequencies 6566
    electrical computing methods 7451
    bipolar expansion of Coulombic potentials 7530
    saddle-point integration 8423
    coefficients of asymptotic series 8424
    physical characteristic by curve analysis 8435
Calculus see also *Differential equations*; *Integrals*
    operational, remainder theorem appl. 1559
  integral
    operator calculus for quantum electrodynamics 9268
  variational
    waveguide problem appl. 4551
Californium
    discovery and invest. 2950
Calorimetry see also *Heat of adsorption, etc*; *Specific heat*
    P^{32} source disintegn.-rate meas. 1262
    solids heat capac. and fusion heats 4348
    slow heat evolution meas. 8703
    energy flux of X-rays 8766
Cameras
    for lightning photography 765
    Kerr cell, for ballistic photography 776
    new streak cameras in detonation study 3128
    i.r. camera-theodolite and extreme-distance camera 3987
    for photographic resolving-power meas. 4979
    nuclear, multiple plate 4988
    high-speed, bibliog. 4989
    $f : 1\cdot0$ astron. spectroscopic 5008
    fluorographic, testing method 5296
    underwater, window 5961
    aircraft, mounts 5970
    lens-film combination, opt. resolving power 9889
    image phototube as high-speed shutter 9890
    35-mm high-speed cinematograph 9905
Carbon see also *Diamonds*; *Graphite*
    zero-pressure thermodynamic properties 275
    diffusion in α-iron 656
    burning glow spectrum 940
    de Haas–van Alphen effect 1176
    neutron scattering 1323–4
    C-black, dispersion, stabilization 1443
    diffusion coeff. in Ta and Cb 2082
    charcoal, expansion due to gas adsorption 2142
    charcoal chemisorbed O and inorg. bases and acids 4859
    black, active, benzene vapours adsorption 4863
    amorphous, elec. and thermal conductivities 5350
    C^{14} in archaeological dating 5685
    oil suspensions, elec. conductivity 6219
    heat of sublimation calc. 6934
    precipitation in Fe 8246
    thin films, elec. conductivity 8733–4
    gas C, surface films effect on friction 9038
    activated, adsorption of mixed films 9086
    carbon black reinforcement of rubber 9754
    crystallite growth, graphitizing 9814
Carbon dioxide
    compressibility, 0°–600°c 127
    thermodynamic properties, 0°–600°c and 50 atm. 279
    diel. const. at 9 400 Mc/s 291
    CO_2/H_2, CO_2/N_2, CO_2/A, CO_2/CH_4 thermal diffusion coeff. pressure dependence 896
    gas, ultrasonic propagation constants 905
    refractive index calc. 1715
    self-diffusion temp. dependence 2455
    thermal conductivity at 0°c 2602
    C_v near critical point 2643
    dielectric properties, microwave meas. 2664
    magnetic rotatory power 5618
    intermolecular potential 6789,
    sound vel. near critical point 6799
    heat conduct. and viscosity data 7607
    N_2–CO_2 mixtures, heat conductivity 7804
    self-diffusion coeff. 8568
    diel. const., microwave 8717
    electric breakdown, l.p. to liquid state 8747
    comb. with H_2O and OH ions, kinetics 9050
    molar vol. of dissolved benzene at crit. pt. 9424
    influence on night sky luminescence 9852
Carbon disulphide
    vap., adsorption invest. 714
    anomalous dispersion, i.r. 6830
    magnetic rotatory power, low temp. 8072
Carbon monoxide
    zero-pressure thermodynamic properties 276
    heat of dissoc. 2644
    adsorption on ZnO–Cr_2O_3 3157
    heat conduct. and viscosity data 7607
    effective av. absorpt. coeff. det. 9382
    influence on night sky luminescence 9852
Carbon tetrabromide
    revised law of corresp. states 8709

A complete list of the Subject Headings will be found at the end of the Index.

- **Carbon tetrachloride**
  - diel. const. at 9 400 Mc/s 291
  - viscosity at const. vol., varying temp. 5142
  - in i.r. reflection spectroscopy 5270
  - limiting neg. press. 6768
  - gaseous, compressibility 7608
  - revised law of corresp. states 8709
- **Carbon tetrafluoride**
  - intermolecular potential 6789
  - force field 8090
- **Carborundum**
  - crystals, vicinal faces 7372
  - crystals, spiral growth 7374, 9810, 9812–13
  - cryst. growth, polytypism 9811
- **Catalysis** see also *Reaction kinetics*
  - in liquid metal nucleation phenomena 742
  - surface potential studies 1034
  - rel. to semiconductivity 1056, 1400
  - ammonia oxidation 1397
  - heterogeneous, O^{18} study 1398
  - accessibility rel. to proton relaxation 1404
  - research, stable and unstable isotopes appl. 1405
  - heterogeneous, conditions for surface states 1406
  - hydrogenation over oriented films, parameter effect 1407
  - heterogeneous, surface layer theory 1409
  - role of heterogeneity 1410
  - parahydrogen conversion mechanism 1411
  - contact, active centres hypothesis 1412
  - chemisorption, statistical aspects 1414
  - heterogeneous, heats of chemisorption calc. 1415
  - heterogeneous, activated complex theory 1416–17
  - on inhomogeneous surfaces, kinetics 1418
  - of dehydrogenation by alloys, rel. to electronic structure 1420
  - parahydrogen conversion, rel. to alloy lattice structure 1421
  - heterogeneous, electronic factor 1422
  - ethylene hydrogenation mechanism 1423
  - poisoning rel. to surface area 1424
  - heats of adsorption det. 1449
  - CO_2 adsorption on reduced Ni 1451
  - gas adsorption on metal films 1452
  - desorption rate rel. to surface coverage 2122
  - and chemisorption, review 2123
  - and adsorption on oxides 2124
  - gas on metal adsorption mechanism 2125–6
  - CO/CO_2 isotopic exchange, N or H promotion 3114
  - atomic H recombination, acetylene-catalyzed 3132
  - nitramide and deuterated nitramide base-catalyzed decomp. 3856
  - parahydrogen conversion 3877
  - gaseous formaldehyde polymerization 3883
  - N_2^{30} and N_2^{28} exchange over Fe catalysts 4814
  - Fischer–Tropsch reaction mech. 4819
  - in protein-like systems 4835
  - styrene polymerization invest. 4837, 5857
  - autocatalysis in protein systems and neg. catalysis 5859
  - evap. Ni, methane/D reaction 7344
  - NH_3 synthesis on Fe, rate equation 8291
  - periodic reaction between H_2O_2 and HIO_3 9044
  - parahydrogen conversion on W 9058
  - elec. field influence 9766
- **Catalysts**
  - promoted MoO_2, physical properties 1399
  - dispersion, X-ray scattering study 1401
  - electron microscope and X-ray scattering study 1402
  - oxide catalyst systems 1403, 1419, 2124
  - hydrogenation 1408
  - poisoning sensitivity 1424
  - *d*-band importance in hydrogenation 2123
  - Pd-on-charcoal for H–D exchange reactions 2545
  - e.m. fields 3131
  - promoted Fe synthetic NH_3, H adsorption 3156
  - $ZnO–Cr_2O_3$, methanol synthesis, CO and H adsorption 3157
  - promoted Fe synthetic NH_3, N adsorption 3158
  - O and CO chemisorption invest. 3876
  - Fe and Fe oxide catalysts, thermomag. invest. 4836
  - Ni, activation by heat treatment 5858
  - Mn oxygen compounds 5865, 7332

Catalysts—*contd.*
  - Fe-type, NH_3-synthesis rate eq. 8291
  - chemisorption of H on reduced Cu 8313
  - silica/alumina xerogel, sintering study 9787
- **Cataphoresis** see *Electrophoresis*
- **Cathode ray tubes** see *Electron tubes*
- **Cathode rays** see *Electron beams*
- **Cathodes** see also *Electron emission*
  - filament end-cooling 406
  - borides of alk.-earth and rare-earth metals 3602
  - "hairpin," electron optics 4433
  - **oxide** see also *Thermionic emission*
    - effect of coating composition on emission 405
    - $BaWO_3$ on W cathode interface 407
    - thoria, thermionic props., and activation 1145, 7987
    - thoria, thermo-electronic processes 1146
    - thoria-coated W, invest. 1147–8
    - thoria, emissivity changes 1149
    - BaO reduction by C, l.p. equilibrium 1387
    - radioactive tracer study 1894, 3599
    - Ni and oxide, spectral emittance 2492
    - SrO vaporization 2608
    - Al_2O_3 coating invest. 2681
    - leaky-condenser interface 2777
    - deterioration under low duty 2778
    - SrO reduction by W 3117
    - base metal studies 3600
    - Ba oxide on W, interface 4490–1
    - poisoned, activation 5509
    - behaviour in gaseous discharge, spect. study 5511
    - thoria-coated, secondary emission study 6264
    - BaO–SrO–CaO, pulsed 6292
    - emission decay due to adsorption 6293, 9565
    - Schottky effect 6294
    - emission mechanism in impulse conditions 7045
    - bombardment-enhanced emission, origin 7046
    - photo-emissive, photoconductivity 7896
    - initial decay 7985
    - radioactivity influence on thermionic emission 7986
    - sources of cold emission electrons, spark gaps 8749
    - (Ba–Sr)O, illuminated, thermionic emission 8807
    - crystal size, X-ray diff. study 8808
    - BaO and SrO evap. products on different metals 9567
- **Cavitation** see also *Vortices*
  - gas evolution in liquids, invest. 870
  - ultrasonic absorption due to 912
  - effects near 30 c/s 5149
  - in ultrasonic depolymerization 5190
  - and haemolysis by ultrasonics 7630
  - at surface roughnesses 8553
  - ultrasonic, phys. and chem. props. 9303
- **Cavity resonators** see *Electromagnetic oscillations*; *Resonators, acoustic*
- **Celestial mechanics**
  - stellar dynamics theory 38
  - stars space motions 39
  - star streaming dynamics 40
  - moving cluster convergent, det. 42
  - matrices appl. 1571
  - *n*-body problem 1572
  - motion under force producing accel. $-\mu_1 r^{-2} - 3\mu_2 r^{-4}$ 1573
  - planetary distances and rotation 2305
  - Kepler's equation, nomograms 5975
  - restricted 3-bodies problem and radiation-pressure 5979
  - disk rotating in Galilean system 6017
  - unstable systems of *n* bodies 8436
  - gravitating bodies system, evolution 8448
- **Centrifuges**
  - liquid flow, Bernoulli eq. 1649
  - magnetically suspended, vac. ultracentrifuge 4122
  - Xe, Kr, Se isotopes enrichment 5678
  - isotope sep., convection processes 5679
  - isotope enrichment, with H stabilization 5680–1
- **Ceramics**
  - Ba–Sr titanate, thermal exp. and sp. ht. 1797
  - $BaTiO_3$ solid soln., d.c. resistance 1828
  - for nuclear reactors, survey 2056
  - dielectric losses and breakdown 6952
  - oxides free from plasticity, production 8245
- **Cerium**
  - Gray's ionization theory correction factor 6287
  - atomic heat 6395

- **Change of state** see *Phase transformations*; *Thermal transformations*
- **Charge** see *Electric charge*
- **Chemical analysis** see also *Spectrochemical analysis*
  - qualitative, of fatty acids, ultrasonic method 1671
  - automatic operations, review 3884
  - 3-gas mixture, thermal cond. bridge 3889
  - O, by paramag. props. 3890
  - gas, infrared, German indust. instrum. 4346
  - liquid hydrocarbons, electron diff. purity control 4787
  - gas, thermal diff. appl. 4882
  - neutron autoradiographic U and Th det. 5807
  - MnO_2 thermal anal. 5898
  - diffusion apparatus for separation 7606
  - Th, survey of methods 8324
  - gas, errors due to thermal diffusion 8572
  - ionography, irrigation rate relationships 9105
  - 2-dimensional electrophoresis and ionophoresis 9106
  - Cd in ZnS/CdS phosphors, electrolytic 9107
  - coulometric, const. current supply 9112
  - automatic optical rotation meas. 9403
  - sensitivity increase by elec. field 9766
  - paper for Hg vapour estimation 9798
  - **adsorption** see *Chromatography*
  - **conductimetric**
    - rectified r.f. graph distortion 1467
    - annual review, bibliog. 3886
    - r.f., textbook 3888
    - meas. of reaction rate 7341
    - *p*H meter, auxiliary circuits 8322
  - **polarographic**
    - automatic recording polarograph 693
    - ionic strength rel. to half-wave potentials 696
    - critical micelle conc. 1465
    - stationary Pt. microelectrode in half-wave potls. det. 1466
    - improved electrometric adsorption element 2150–1
    - continuous flow respirometer 2239
    - Hg, survey 3179
    - dropping amalgam electrodes 3180, 7365
    - annual review, bibliog. 3885
    - dropping Hg electrode, non-electrical props. 3887
    - applied voltage freq. effect 4881
    - millicoulometry, polarographic *n*-values, det. 5895
    - a.c., theory, technique 5896
    - a.c., Cd, Zn, Pb, Tl, In, Bi, Sb 5897
    - influence of applied voltage freq. 6552
    - oscillographic, cause of errors 9108
    - oscillographic, quiescent period phenomena 9109
    - electrons involved in polarographic reduction, est. 9110
    - Ilkovic eq. diffusion term test 9111
    - Ni potentials in foreign ion solution 9113
    - vibrating Hg electrode for agitated solutions 9114
  - **positive rays** see also *Mass spectrometers*
    - mass spectrograph for gas analysis 2154
    - hydrocarbons total ionization, mass spectra data 2155
    - heavy water, mass spectrometer det. 3184
    - C_1–C_4 monodeutero-paraffins 4483
    - C^{13}-subst. propanes and butanes 4484
    - mass spectra qual. anal. 4880
    - mass spectrometers, review 4883
    - mass spectrometer, solids anal. 4885
    - parent peak intensities in D substitution 7368
    - acetaldehyde photolysis products 8302
  - **radioactive**
    - tritium 1468
    - det. of U and Th in rocks 2936
    - Th content of thoriated W 3181
    - B in Pyrex, neutron absorption method 3182
    - Co in Ni, oxide cathodes study 3599
    - annual review, bibliog. 3891
    - Li in minerals, by *n*-irradiation 4884
    - H^3 assay by CH_4^3 counting 7201
    - U^{235} in U^{238}, photoneutron fission anal. 7284
    - Oak Ridge reactor, activation anal. appl. 7367
    - artificial radioelements and neutrons, survey 8325
    - radioactive H as tritiobutane 9115
    - chromatography appl. 9116
    - Szilard–Chalmers, slow and fast neutrons 9779
    - Cr, V and Mo det. by radioactive Ag 9803
- **Chemical analysis**—*contd.*
  - **X-ray** see also *X-ray examination*
    - annual review, bibliog. 3896
    - with bent crystals 4411
    - bent-crystal spectroscopy appl. 4412
    - S in petroleum, by absorption 8329
    - U in solution, by absorption 8330
    - solid aromatic hydrocarbons 8331
- **Chemical effects of radiations** see also *Nuclear reactions, chemical effects*; *Photochemistry*
  - **acoustic waves**
    - ultrasonic, theory 2468
    - H electrode sensitivity 3144
    - ultrasonic, on high polymers 3178, 5193
    - ultrasound, effect on NH_4NO_3 polymorphic transformation 3410
    - ultrasonography 4179
    - aq. solns., analogy with ionizing radiations action 7352
    - phot. emulsions activation 7633
    - ultrasonic cavitation phenomena 9303
  - **ionizing radiations**
    - X-ray chemical effects, chloral hydrate 706
    - microcrystal formation with Po–α-rays 739
    - X-rays on nucleic acids 1434
    - collagen, electron irradiation effect 2132
    - polymerization by α-rays 2135
    - phosphorescence quenching 5293
    - toluene, mesitylene and ethylbenzene, radiolysis 5867
    - atomic pile radiation on water and B solns. 5872
    - ferrous sulphate solns., X- and γ-rays 5873
    - neg.-ion formation by electron capture, neutral molecules 5874
    - colorimetric dosimeter 6538
    - lateral distrib. of ions across particle track 7043
    - high-energy X-rays, H_2O_2 decomp. 9772
    - water decomp. by α-rays 9773
    - *n* on pyridine oxalate 9774
    - symposium 9775
    - $Cl^{35}(\gamma, n)Cl^{34}$ reaction in $NaClO_3$ 9776
    - aromatic hydrocarbons radiolysis, impingement velocity effect 9777
    - polymerization by α-particles, liq. and gas phases 8304
    - water, H and OH radicals formation 8306
    - high-intensity γ-ray source 8307
- **Chemical reactions** see also *Heat of reaction*; *Oxidation*; *Photochemistry*; *Polymerization*; *Reaction kinetics*
  - reactivity, effect of molecular vibrations 536
  - Arrhenius parameters, rel. to reactivity 692
  - chain reactions, non-stationary phase 707
  - in magnetic field 1210
  - Walden inversion and reaction mechanism 1391
  - chemisorption, statistical aspects 1414
  - C_2H_4 catalytic hydrogenation, mechanism 1423
  - PbO_2 decomposition 1456
  - electron transfer and interaction absorption 2131
  - proteins in solution 3108
  - detonative, physical chemistry 3127
  - intramolecular, in linear polycondensations 3176
  - intramolecular, polydecamethylene adipate ring-chain equilib. 3177
  - aromatic systems annelation energy 3690
  - organic, energy and entropy changes 3855
  - wall reactions and diffusion, static and flow systems 4154
  - N_2H_4–H_2O_2, h.p., thermochem. props. 4811
  - C^{14} isotope, effect in inorg. equilib. 4812
  - free radical, steric factor 4816–17
  - Fischer–Tropsch reaction mech. 4819
  - radicals from Na on alkyl iodides 4820
  - methylcyclopentane with Hg $6(^3P_1)$ atoms 4821
  - thermal H–O, at rel. low temps. 4827
  - methyl radicals recomb. 4830
  - H atoms abstraction from paraffins 4845
  - H atoms abstraction from olefins 4846
  - diffusion-rel. to growth of colloid particles 4854
  - non-isothermal, thermal interaction principle 5846
  - excited ethylene decomp. 5851
  - nitromethane, thermal decomp., flow method 5852
  - malonic-1-C^{14} acid decarboxylation, isotope effect 5853
  - CO_2–C, C^{14} tracer study 5854

A complete list of the Subject Headings will be found at the end of the Index.

Chemical reactions—*contd.*
    radicals decomp. by Hg photo-sensitization 5868
    O_3–H_2O_2, thermal and photochem. 5869
    non-stationary state, refractometric invest. 6834
    gas mixtures, thermodynamic props. 6935
    chemical dosimetry 7200
    hydroxyl radical 7333
    ionization in flames 7335
    H–O, at 2nd explosion limit 7338
    methane and D on Ni catalysts 7344
    bromination of neopentane 7349
    free radicals prod. in aq. medium, survey 7351
    aq. solns., analogy with ultrasonics action 7352
    method for producing SeO_3 7356
    pyrolysis *iso*-propyl bromide 7357
    phys. chem. textbook 8280
    unimolec., freq. factor significance 8289
    electric and chem. potls. rel. 8294
    neopentane and H, bromination 8303
    periodic, between H_2O_2 and HIO_3 9044
    Np(IV) and (V), oxidation-reduction 9046
    chain, photochemically induced, wall effects 9068
    Cl atom reactions, chain termination mech. 9069
    ionization density var., effects 9071
    free valence in unsat. hydrocarbons 9093
    acceleration by elec. field 9766
    physical description 9767
    Liesegang ring formation, NH_3, HCl 9781
Chemical structure see also *Bonds*; *Stereochemistry*
    thiophthen, length of central bond 2184, 3881
    int. order and molecular props., liquids 2650
    aromatic electron bonds in graphite 3879
    adenine hydrochloride 3938
    guanine hydrochloride 3939
    effect on —COOH i.r. freq. 5275
    methylacenes and methylenedihydroacenes, rel. stability 5890
    rubber-like matls., chain networks 6549
    nuclear mag. resonance study of polymers 6550
    systems of acidity 7358
    unimerism 7360
    liquid hydrocarbons, nuclear proton resonance 8109
    transition state, orbital hybrid bonds 8319
    polymorphic transformations in solid solns. and double salts 8320
    n-acetylglycine, diketopiperazine polarized i.r. spectrum 8636
    invest. by paramag. resonance absorption 8846
    clathrate compounds 9095
  electrical effects
    ketones diel. props. 4365
  magnetic effects see also *Magnetochemistry*
    persulphuric ion, magnetochem. 7714
    quadricovalent Cu^{++} and Ni^{++}, magnetochem. 9101
  magneto-optical effects
    H_2O_2, mag. rotatory power 3689
  mechanical effects
    acetylene derivs., ultrasonic invest. 118
    intrinsic viscosity and M.W. in nitrocelluloses 727
    ring structures and polar groups, rel. to viscosity 1638
    ultrasonic velocity dispersion in fatty acids 1671, 2464
    ditto, in organic vapours 1672
    aralkyl chlorides solvolysis, intramol. config. effect 4822
    additive molec. properties, central force model 4876
    deformation props. rel. to struct. 9028
  optical effects
    optical rotation and atomic dimension 555
    basic dyes, molecular-orbital theory 726
    diketo-pyrazolidine derivs. 1463
    polymers optical anisotropy 2591
    substituent group spectroscopic moment prod. 4577
    substituents influence on Raman spectra 4296
    new constant, refractor 5894
    dye phosphors rel. to H bonds 5893
    benzene cpds., infra-red spectra patterns 7737
    subst. benzenes and naphthalenes, spectra 7756
    quindoline, substituents' effect on u.v. absorpt. 8633
    flow birefringence, calc. 8664
    glasses molecular refractivity 9100
    optical rotation rel. to chain configuration 9796
Chemical structure—*contd.*
  thermal effects
    hydrocarbons and fluorocarbons, evap. characteristics 3486
    propylene dichloride isomers, energy difference 7364
Chemical technology
    vacuum system leak detectors 880
    semiconductors 7891
    radioactive dust separation 8400–1
Cherenkov radiation see *Electrons, radiation*
Chlorine
    zero-pressure thermodynamic properties 275
    solid, quadrupole spectrum 8091
Chloroform
    limiting neg. press. 6768
    droplets, light scattering 7785
Chromatography see also *Adsorption*
    electronic image converter for i.r. and u.v. 728
    ion exchange resins 729
    kinetics, admittance concept 2426
    radioisotope separation, semi-industrial 3155
    u.v. appl. 3185
    annual review, bibliog. 3897
    radioactive analysis 3898
    kinetics, Jones reductor appl. 4824
    new paper method for cation sep. 8332
    radiochemical techniques 9116
    simplified coupled filter 9121
Chromium
    diffusion in iron and steel, spectrographic det. 3064
    gas adsorption, room-temp. 6541
    X-ray atomic scattering factor 8762
Chromium alum
    paramag. resonance at various temps. 1931–3, 9599
    CrK alum, spin relaxation time 5580
Chromium nitrate
    specific heat 65°–300°K 272
Chromium oxide
    lattice change near Curie temp. 492, 9597
    antiferromagnetism and structure 8025
Chromium sulphate
    specific heat 65°–300°K 272
Chromium sulphide
    ferromag., specific heat 2641
    mag. and elec. props. 7851
Chrysene
    crystallographic data 9162
Cinematography see also *Cameras*
    cine-radiography, new $f/0{\cdot}71$ lens 6667
  high-speed see also *Photography, high-speed*
    cine-micrography 4322
    bibliography 4989
    techniques, survey 7443
    35-mm camera 9905
Clay
    clay minerals, X-ray examination 1352
Climatology
    main weather features, progress review 2217
    8-years' cycle 2218
    temp. trends, past century 4934
    deep-sea core analyses invest. 4935
    present variations 4944
    palaeoclimatological evidence, review 4945
    recent changes, periodicity 6642
Cloud chambers see also *Counters*
    internal counter control 397
    2-counter control 398
    Pb cascade showers study 1095
    self-triggering counter 1886
    triggered, expansion valve 1889
    positive tracks invest. 2010
    path of magnetic monopole, theory 2064
    electron range-momentum meas. 2729
    for study of spark breakdown 3537
    Wilson diaphragm type, press. stabilizing device 3593
    diffusion, continuously sensitive 3594
    multiple scattering 4451
    cloud-ionization chamber for cosmic-ray interactions 4469
    continuously sensitive 4476*
    permanent magnets design 4478
    triggering, in nuclear interaction study 4514
    arc-lamp triggering circuit 5502

Cloud chambers—*contd.*
scattering distrib., effects of geometry 6285
clouds in expansion chamber from u.v. light 7041
"slow expansion," positron scatt. study 7939
large, for cosmic-ray research 9557
diffusion types 9558
Clouds
rain formation by coalescence 1543
electrical precipitation 1544, 4941
AgI ice precipitation, time-lag 1545
rate of nucleation 2214
sound wave propagation 2215
drop enlargement by fusion 3986
shower, structure 4937
microphysics study 4938
ice and AgI seeding 4939–40
artificial precipitation disc. 4942
seeding, review of effectiveness 5939
seeding, sunlight effect on AgI particles 5940
Schaefer–Langmuir seeding technique trials 6641
AgI nuclei photolytic inactivation 7350
cumulo-nimbus descending currents formation 7414
microphysics, review 7417
absorption of sunlight 9211
layer-type, droplets size 9212
drop-size formula 9213
coalescence of droplets 9214
billow, dimensions formula 9215
thunder-, distrib. of electricity in 9856
Cobalt
self-diffusion 1341, 4774
anodic behaviour 1429
phase transformation theory 3908
oxidation kinetics 5856, 7339
domains in single crystal 6323
spontaneous magnetization 7107
Co^{60} as therapeutic alternative to Ra 7435
magnetic viscosity, temp.-dependence 9607
Cobalt chloride
infl. of mag. field on crystallization 9808
Cobalt nitrate
specific heat 65° to 300°K 272
Cobalt oxide
antiferromagnetism 6332
Cobalt sulphate
sulphates, paramagnetic resonance 5577, 8037
Co ammonium sulphate adiabatic demagnetization 5571
ditto, low-temp. magnetic props. 5582
ditto, critical mag. field phenomena 8835
Cold working see also *Plastic deformation*; *Slip*; *Work hardening*
metals, deformation textures devel. 1373, 9030, 9752
metals, fundamentals 3829
effect on orientation in Si ferrite 7083
recovery process 7326
α–Fe, precipitation of C and N 8246
Fe, rel. to plastic deform. heterogeneity 8266
Cu single crystals, internal friction 9040
Lüders deformation characteristics, steel 9749
steel, grain boundary theory 9750
Collections of physical data Only comprehensive works of reference are listed here
molecular spectra 186, 2502
wind-tunnel and jet-engine gases, thermal properties 252
neutron cross-sections of elements 650
atomic constants, re-evaluation 2356
complete nuclear data tables 2938, 6402
Barker crystal index 3902
optical cryst. matls., mech. and thermal props. 4229
atomic constants (Dec. 1950) 5061
atomic spectra analyses and nuclear moments 5255
solar radiation, Kew (1933–46) 6640
beta-decay *ft* values, table 7209
thermocouple reference tables 8746
sound velocity, 80 liquids 9314
electric dipole moments tables 9442
Collision processes see also *Ionization*; *Nuclear forces*; *Nuclear reactions*; *Scattering, particles*
nucleon-nucleon, Bremsstrahlung 76
O$^-$ ionization by electron impact 403
A–Hg discharge, 2 537 radiation production 1079
Collision processes—*contd.*
electron-nucleus, screening effect 1297
nucleon-nucleon, meson multiple production 1316
photon-nucleon, spin zero meson production 1317
quantum theory, momentum space transf. 1597
variational methods 1616
v. high energy, in cosmic ray bursts 1911
90 MeV neutron ejection of protons and deuterons 2050
nucleons, cosmic-ray primaries, energy degeneration 2783
nuclear, low-energy π-meson production 3049
high-energy nuclear events 3336
variational method electron scattering invest. 3572
charged particles energy loss 3573
2-electron angular wave functions 4082
heavy nuclei, radiative processes 4096
cascade showers, ang. and radial distrib. 4506
v. fast particles, recent exptl. work 4689
π-meson production, ang. distrib. 4751
photon/nucleus, meson production 4757
nucleon-nucleon, π-meson prod. 5123, 6748
p–p, meson production 5126
ion/atom in He, Ne and A, cross-sections 5507
production of π-mesons 5800, 4748*
inelastic, variational method 6025
spin $\frac{1}{2}$ particles, electron-positron pairs creation 6738
photon production, theory 7286
collision cross-sections calc., simplification 7548
one particle with system of particles 7551
cross-sections calc. simplification 7548
nucl. excitation by elec. interact. with particles 8218
π^+ meson prod. in C 8220
high-energy nucleon-nucleon, diff. cross-section 8514
neutron-proton, e.m. radiation 8527
fast nucleons with deuterons 8968
high-energy nucleon-nucleon, vector π-meson prod. 8989
non-stationary processes, damping 9272
formation of many particles at once 9275
nomogram of energies, momenta 9281
particles with mag. mom. and spin, "Bremsstrahlung" 9529
μ-mesons nuclear interactions underground 9684
Colloids see also *Electrophoresis*; *Emulsions*; *Gels*; *Sols*; *Thixotropy*
Kelvin's contributions 708
macromolecule solutions, spectrophotometric mol. wt. det. 709
mineral, low-angle X-ray scattering 1088
long-chain molecules in soln., hydrodynamics 1437
spherulitic sectors 1438
polystyrene in soln., streaming birefringence 1439
polarographic critical micelle conc. 1465
interaction of charged particles, theory 2136–7
electrolytes aggregation, mass law appl. 3868
Au, C, low-angle X-ray scatt. 3869
diffusion in reaction processes, rel. to particle growth 4854
uniform dispersions, growth 4856
scattering of light 5330
electrolytes, gegen ions effect on light scattering 5331
electrolyte potl. problem solns. 7348
Na silicate solutions, light-scattering invest. 7353
flotation, liq. flow under interfacial tension 7596
ion distrib. under charged monolayers 7599
phys. chem. textbook 8280
water solubilization in non-polar solvents 8563
dispersed magnetized particles, dielectrics and rheology 8721
diffuse layer, interionic attraction theory 9062
electrical double layer on AgI 9072
coagulation, modern concepts, review 9073
theory of anisotropic solutions 9081
coloured rocksalt with colloidal Na 9408
orientation in dried Al$_2$O$_3$ sols. 9741
particle interaction, Stern double layer theory appl. 9780
electron and X-ray study, hydrated oxides 9783
double layer free energy 9789
Colorimeters
colour temperature meter 924
electronic, complete spectral curve 4316

A complete list of the Subject Headings will be found at the end of the Index.

Colorimeters—*contd.*
  tristimulus photometer 5229
  Barnes, circuit 7794
  industrial tristimulus matcher 8665
  photoelectric comparator 9405
Colorimetry see also *Chemical analysis*; *Spectrophotometry*
  standard colours, physical theory 997
  constant hue and brightness det. 1000
  luminous mixtures, graphical synthesis and resolution 1001
  tomato purées, small differences 1002
  adsorbed gases: thermal props. meas. 1024
  light sources, specification and meas. 1790
  illuminant-converting filter 2550
  thin layers on glass, interference colours 4306
  exptl. test of principles 4315
  electronic method 4316
  visual colour-difference sensitivity 4960
  concentration and luminance diagrams 5337
  equal sensory differences system 5338
  chromaticity transformation nomograms 5339
  heterochromatic photometry 6094
  in colour reproduction evaluation 6905
  American standard methods 7791
  fluorescent lamps 7792
  intensity and voltage var. effect on accuracy 7793
  thermochemical, balanced pair 7824
  index for illuminants colour 8666
  C.I.E. chromaticity co-ordinates 9404
  modern problems 9406
Colour see also *Photography, colour*
  dyes, rel. to constitution 726
  diketo-pyrazolidine derivs., rel. to structure 1463
  rubies, effect of heat 1475
  fluorescent lamps for matching 1782
  photochromism in bianthrone series 1783
  light sources, specification and meas. 1790
  subjective spectral band limits 2247
  of reflection-reducing films 5313
  sensitive, rel. to colour temp. in crystals 5336
  changes, day and night light 6156
  rel. to lighting 6157
  tolerance specifications for paint 7788
  concept white, neutral adaptation 7789–90
  meas. and spec., American standard methods 7791
  coloured addition compds. 7795
  index for illuminants colour 8666
  Munsell book in textiles 8667
  $KClO_3$ cryst. interference colours 9409
 theory
  colour circle and standard colours 997
  colour triangle 998–9, 1001
  constant hue and brightness loci 1000
  equal sensory differences system 5338
Colour centres
  KI photoelectric emission 318
  ionic crystals, colour centre theory 730
  alkali halides, trapped hole colour centres 731
  alkali halides, luminescence 732
  rocksalt discoloration 734
  ZnS, traps and luminescence centres identity 1752
  alkali halide *V*-centres 2522
  absorption and non-radiative transitions 3196
  RbI F′ centres, energy distrib. photo electrons 4391, 6973, 7900
  alkali halides, new absorption bands 5272
  rock salt *K*-centres 6134
  formed by X-rays on quartz 6558
  Ag halide, photographic emulsions 6668
  MgO crystals, additive colouring 7370
  alkali halides with added divalent ions 7381
  role in photography, review 7441
  NaCl, electron trapping in 7775
  in paramag. reson. absorption crystals 8039
  energy levels calc. 8343
  formed by α-rays in rocksalt 9407
  ditto, with colloidal Na 9408
Colour vision
  colour triangle 998–9, 1001
  surrounding colour adaptation 1000
  995 individuals invest. 2244
  consequences of luminosities additivity 2245
Colour vision—*contd.*
  anomalies, discussion of theories 2246
  subjective spectral band limits 2247
  sensitivity to colour differences 4960
  model of retina events 5948
  colour blindness, mechanism 5951
  retinal responses to micro-stimulation 6658
  white, neutral adaptation 7789–90
  sensitivity changes with posture 8390
  binocular fusion of yellow 9867
  adaptation to illuminant colour 9868
Columbium see *Niobium*
Combustion see also *Explosions*; *Flames*; *Heat of combustion*; *Reaction kinetics*
  burning velocities from flame shadows 259
  effect of S on C flames 260
  powders, burning rate at h.p. 1012
  explosive, gaseous mixtures, mech. 2616
  initial temp. effect on flame vel. 2617
  slow self-propagating reactions in solids 3115
  detonation initiation 3123
  methane-air, by compression 3495
  methyl ethyl ketone cool flame 3496
  burning vel. det., ethylene + air + CO_2 4826
  turbulent burning vel. theory 5355
  fuel particles 6173
  in rocket motor 6764
  flame front effect on flow field 6926
  1st-stage, spectra 6927
  propane-air inflammability ranges 7336
  "knock" reactions 8282
  flame propag., gaseous mixtures 8284
  gases, effect of turbulence 8692
  gases, thermodynam. study, textbook 8706
  cool flames with ethylene 9763
  flame propagation theory 9764
Comets
  nucleus structure 29
  Encke's, note on temp. 5021
  and meteors, physical relations 6685
Compressibility see also *Elasticity*; *High-pressure effects*
  and absorption frequency, ionic crystals 2104
  ionic crystals, rel. to polarization oscillations 2162
  soil consolidation 3066
  LiF crystal, calc. 3681
  rubber, rel. to volume changes on stretching 3822
  radiographic dilatometric meas. 4330
  metals pressure/compressibility rel. 4573
  powdered material 4809
  leather, 10 000 atmos. 5843
  high polymers, high pressure 5844
  adiabatic, ideal liq. mixtures 6065
  CCl_4, SF_6 7608
  ductile matl. between flat dies, theory 8268
 gases
  CO_2, 0°–600°c 127
  wind-tunnel and jet-engine gases 252
  approx. law in plane flow 2442
  N_2, theory 2456
  acoustic phenomena 4192
  meas. up to 10,000 atmos. 9328–9
 liquids
  acetylene derivs, ultrasonic 118
  molten Na, temp. variation 105
  liquid metals, from ultrasonic velocities 909
  organic solutions 3409
  relaxational, from acoustic phenomena 4192
  from ultrasonics velocity meas. 4213
  organic solutions, adiabatic 7635
  data from sound velocity 9312
  ions, adiabatic, effect of electrolysis 9316
Compton effect
  Compton electrons accurate focusing 6254
  in crystals, new method of observation 9825
Computers see *Calculating apparatus*
Concrete
  elasticity modulus det. 672
  M.I.T. cyclotron wall shielding properties 1334
Condensation see also *Drops*; *Fog*
  in clustering Bose–Einstein gas 99
  unsteady-state diffusion 125
  effect on Bose–Einstein gas coeffs. 1664
  retrograde, in liquid-vapour equilib. 1666

Condensation—*contd.*
association theory and critical phenomena 1798
supersaturated gas, nucleation 2143
nuclei, electron microscope invest. 2213
perfect Bose–Einstein gas 2398–9
capillary, in adsorption 3162
water, in shock waves 3490
atmospheric, review 3965
statist. mech. treatment 5133
supersat. vapour self-nucleation time lag 5354
Mayer–Born–Fuchs theory, statist. mech. appl. 6187
theory, cluster integrals 6924
clouds in expansion chamber due to u.v. 7041
in clouds, review 7417
of Bose gas 7566
air, in hypersonic flow 7616
nucleation in very rapid expansions 8690
droplet size in layer-type cloud 9212
water vapour, spontaneous, expansion chamber expts. 9422
automatic dew-point hygrometer 9799

Conduction, electrical see also *Conductivity, electrical*; *Contact resistance*; *Current*; *Photoconductivity*; *Resistance, electrical*; *Semiconductors*; *Superconductivity*
Bloch's theory and superconductivity 325
ionic conductivity in crystals 735
electron scattering in crystals in field 1108
NaCl, current impulses due to α-rays 1126
Hall potential across inhomogeneous conductor 1209
electron theory 1826, 8872
gases, rapid meas. 1837
ionic and electronic, in Al_2O_3 2681
electron-bombardment-induced currents in zinc-blende 2751
surfaces, in H-treated Pb-silicate glass 3528
gaseous, turbulence 3529
rel. to ferromagnetism 4616, 5670
cold-working, effect 5402
ionic conductivity glass, activation energy 6492
electron behaviour, ionic crystals 6957
electron mobility in AgCl 6959
CdS electron mobility 6967
masses of carriers 7847
inertia of carrier in Cd 7848
intermetallic compds. 7849
metals, "internal size-effect" 7850
electronic, new phenomena in semiconductors 7858
in irradiated alkali halide crystals 7863
in AgCl crystals 7864
across pipe filled with cond. fluid 7893
electron path-length problems 9460
theories of "flicker" effect 9461
thin metal films, theory 9462
one-phase monovalent metals, rel. to temp. 9483
crystal electron theory 9625

Conduction, heat see *Heat conduction*

Conductivity, electrical see also *Resistance, electrical*; *Semiconductors*
electron conductivity and mean free paths 349
thixotropic materials 711
ionized gas 1059
metals self-diffusion meas. 1342
metallic films, mag. field effect 1853
liquids, meas. without electrodes 2693
oxide ferromagnetics, freq. var. 2833
non-aq. disperse systems 3508
Al conducting bridge formation in vaseline 3550, 6248
proton conductivity, solid alcohols 4375
blood, red cells 4976
cold-worked metals 5402
dielectrics under electron bombardment 5412
hard dielectrics, temp. hysteresis 6205
semiconductors, theory 6211
surface, acicular crystals 6886
disperse systems 6951
temp. dependence, semiconductors 7876
evap. metal films 7887
films containing gaps, temp. dependence 8726
ionic crystals 8728
solvent-electrolytes 25°c to −73°c 9321
in protein electrophoresis 9499–501

Conductivity, electrical—*contd.*
hygroscopic films, use as hygrometer 9797
Al, rel. to elastic deformation 9496
Ag thin films, in intense field 1047
Ag, low temp. 3531
Ag. rel. to elastic deformation 9496
Ag/Ag-halide electrodes 3865
alumina 2681
AgBr with impurities 9464–5
Au films, contam. by W oxides 3070
low temp. 3531
Au, rel. to elastic deformation 9496
BaO crystals 7884
$BaTiO_3$, discontinuities 3517
borax glasses containing dispersed Au 2679
graphite and amorphous C 5350
carbon/oil suspensions 6219
thin C films 8733–4
C_8K, C_8B 3879
CdO 7880
CdS cryst., var. with α-irradiation 5298
CdS, var. with electron irradiation 6220
Cu, low temp. 3531
Cu, rel. to elastic deformation 9496
Cu alloys, correl. with plasticity 3098
Cu–Ni alloy, low. temp. 3479
Cu_2O 2670
β–Cu_2S, anomalous 1050
Cr sulphides 7851
thin Fe films, liq. He temp. 3530
Fe sulphides 7851
Ge, alpha-particle-induced changes 2687
Ge, characteristics 7862
glass 8760
molten Hg and NH_4 halide systems 2692
magnetite, transformation temp. effect 1829, 5403
Mn ferromagnetic compds. 309
Mo, rel. to elastic deformation 9496
MoO_2 1399
MoO_3 1049
$MoSi_2$, metallic behaviour 2683
organic Na salts 9466
Ni ferrite 8032
NiO 7880
Pb glasses 6212
PbS, effect of O and heating rate 7881
PbS, lattice disorder 9469
Pb sulphide and telluride temp. dependence 7870
Pt, rel. to elastic deformation 9496
Rochelle salt, h.p. moulded 3900
Se coatings 4387
Se single crystals 7878
Se, micro-cryst., with I impurities 7879
Sn, grey 313*, 1048, 3524–5, 7869
of skin, meas. 8389
soil, at u.h.f. 6950
Ti single crystals 3526
W, rel. to elastic deformation 9496
ZnO 1056, 6963

electrolytic see also *Chemical analysis, conductimetric*; *Ion velocity*
ionic, in crystals 735
ionic, of Li-halide crystals 1482
ethanol + H_2O + H_2SO_4, rel. to solvent comp. 2128
variable-cell meas. 3135
weak electrolytes, high field strengths 3136
h.f., of paraffin-chain salts 3137
DCl, NaOD, anomalous ionic mobilities 3138
spark electrolysis, mech. surface effect 3140
K and La cobalticyanides and ferricyanides 3858
new conductivity meter 3859
strong electrolytes, aq. soln. 4838
liquid silicates 4839
conc. electrolyte systems, rel. to temp. and conc. 6530
as meas. of reaction rate 7341
Na and KCl in methanol 7345–6
h.f. meas. in high-viscosity solutions 8293
rel. to heat conduct. and chem. react. 8294
6 : 1 valency type electrolyte, aq. soln. 9059
Onsager's eq., empirical extension 9060
effect of ultrasonic beam 9316
NaCl, h.f. 9444

A complete list of the Subject Headings will be found at the end of the Index.

- **Conductivity, thermal** see also *Heat conduction*
    - envelope type tests, theory 3478, 6163
    - liquids and polymers, rel. to viscosity 4327
    - dense matter, calc. 6164
    - **gases**
        - steam and N, new meas. 251
        - wind-tunnel and jet-engine gases 252
        - Bose–Einstein gas model 263
        - He 277
        - accommodation coeffs. on Pt. 898
        - polyatomic gases at 0°C, press. dependence 2602
        - bridge for 3-gas analysis 3889
        - gas, German indust. meas. 4346
        - gas mixtures 5351
        - data for He, A, H_2, O_2, N_2, CO, CO_2, H_2O, air 7607
        - N_2–CO_2 mixtures 7804
    - **liquids**
        - expression for variation 1796
        - He I 2635
        - liq. He 7817, 9427*
        - liq. gases, contrib. to ultrasonic abs. 6085
        - rel. to viscosity 8543
    - **solids**
        - Chroman B2Mo at low temps. 1010
        - quartz, low temp., neutron irradiation effect 1793
        - Sn, Hg, In and Ta at liquid He temps. 1794
        - elastomers, under stretch, low temp. 2598
        - nine crystalline materials 2599
        - barium strontium oxide 2600
        - solid He 2634
        - Cu–Ni alloy, low temp. 3479
        - graphite and amorphous C 5350
        - alloys at low temp. 6920
        - dielectric solids, low temp. 7802–3
        - metal surfaces in contact, He temps. 8677
        - steels, etc., at low temp. 8678
        - diel. crystals, Umklapp process 9416
        - Na_xWO_3 9463
    - **measurement**
        - steels, meas. up to 500°C 1008
        - insulating matls., variable-state method 2597
        - and diffusivity, simultaneous det. 2597
        - small samples of insulators 2599
        - guarded hot plate, errors 8676
        - metals, low temp. 8678
        - bar methods, dia. choice 9414
- **Constants**
    - **atomic**
        - Kohlrausch's system, quantum-mechanical interpretation 558
        - fine-structure and spectroscopic units 559
        - In, liquid He temp. atomic heat 1021
        - *h*/*e* evaluation 1084, 1138, 2357
        - accurate det., review 1247
        - least squares method 2356, 3308–9, 7501
        - Planck's and fine-structure 2358
        - least-squares adjusted values (Dec. 1950) 5061
    - **fundamental**
        - universal, consideration of concepts 824
        - astronomical, revision recommendations 1569
        - astronomical, present system, disc. 1570
        - *e*/*M*, proton cyclotron resonance 5381
        - physical concepts system, structure 6720
        - as functions of age of universe 8442
        - 4-dimensional atomistic measure system 9256
- **Contact angle** see also *Wetting*
    - polytetrafluoroethylene 3380
    - paraffin-wax frothers, det. 6061
    - solid surface tension calc. 8558
- **Contact potential** see also *Zeta potential*
    - meas. in metals oxidation and corrosion study 1032
    - evaporated Fe films in l.p. air and N 1033
    - gases adsorbed on Ni films 1034
    - adsorbed films, meas. 1035
    - effect on contact resistance 1838
    - Volta effect invest. 2658
    - oil-water interface, meas. 3502
    - rel. to dry friction forces 6520
    - between semiconductors of same type 6960
    - semiconductor surface phenomena 7859
    - Ge 7883
    - semiconductor/metal, rel. to contact resist. 8737
- **Contact resistance**
    - Se contacts, electrical forming study 1055
    - metals self-diffusion method 1342
    - dependence on contact potential 1838
    - rectifiers, potl. barrier height, rel. to temp. 7892
- **Convection** see also *Heat transfer*
    - in porous media, critical gradient theory 254
    - deposition images caused by 9327
    - fluid, surface elevation 9417
- **Cooling** see also *Low temperature production*; *Supercooling*
    - by vaporization, effect on vaporization velocity 255
    - aerodynamic 2452, 9335
    - radiation correction 2604
- **Copper**
    - layers, optical properties 227
    - stress-strain curves 665
    - single crystal, surface structures 746
    - self-diffusion meas. without radioactive tracers 1343
    - single crystals, internal friction freq. and temp. dependence 1385
    - Co–Cu and FeNi–Cu, magnetic properties 1923
    - energy absorption in plastic deformation 2096
    - high-purity, creep 2110
    - thermal dilatation, isotropy 2606
    - cold-rolled, resistivity anisotropy 2680
    - oxidation, low temp. 3073
    - friction, strength, hardness, 4°–600°K 3107, 6519
    - single crystal N absorption, anisotropy 3166
    - diffusion coeff. in Hg 3180
    - crystal deformation by abrasion 3190
    - elec. resist. at low temp. 3531
    - coherent twin boundaries, interfacial free energy 4776
    - crystallography and interfacial free energy 4777
    - cold-worked, elec. conductivity 5402
    - single-crystal plastic deformation 5832
    - delayed fracture in creep 5837
    - overvoltage, space charge 6537
    - slow election reflection coeff. 7016
    - single-crystal mag. saturation intensity invest. 7103
    - Poisson's ratio from elect. meas. 7319
    - evap. film, elec. cond. 7887
    - X-ray spectrum fine structure, temp.-dependence calc. 7928
    - abs. energy loss of 18 MeV protons 7956
    - reduced, chemisorption of H on 8313
    - single crystals cold worked, internal friction 9040
    - low-temp. oxidation rate anisotropy 9045
    - effect of deformation on elec. resistivity 9496
    - solid solutions with Zn, Ga, Ge, As, mech. props. 9746
- **Copper caesium sulphate**
    - low-temp. susceptibility 1930
- **Copper chloride**
    - $CuCl_2.2H_2O$ single-crystal antiferromagnetism 6346
- **Copper fluoride**
    - thin film refractive index 2575
- **Copper oxide**
    - surface reactions and catalysis 1413
    - Cu_2O, photoconductivity invest. 1840
    - Cu_2O, electrical props. 2670
    - ext. photoeffect in CuO and Cu_2O 4386
    - rectifiers, theory 5410
    - rectifiers, resistive layer 8730–1
    - rupture of films in sliding 9039
    - Cu_2O, C, O and S content rel. to rectifier props. 9476
- **Copper potassium sulphate**
    - low temp. mag. properties 5586
- **Copper sulphate**
    - crystal growth rate det. 2158
    - magnetic susceptibility 2838
    - soln. diel. props., u.h.f. 9444
    - solutions, paramagnetism 9598
- **Copper sulphide**
    - superconductivity 319
    - anomalous electrical properties 1050
    - formation on Cu, electron diffract. study 6495
    - tarnish formation on Cu, e.m.f. 6533
    - Cu_2S rectification 9467
- **Coriolis forces**
    - vortex from latitude var. 2209
    - motion relative to rotating earth 4123
    - bird navigation theory 6656
    - in modified Eötvös's balance expt. 7572

A complete list of the Subject Headings will be found at the end of the Index.

Corona, electric discharge see also *Breakdown*
- compressed gases, rel. to spark breakdown 1082
- h.f., excitation by neg. ions 1858*
- coaxial cylindrical, in N_2 and O_2 4405, 5440
- d.c., elec. and optical characteristics 6234
- + and − starting potentials 6240
- neg. point to plane, new mode 7914
- from ice points 7915
- point-to-plane, dry air 9504

Corona, solar see also *Astronomical spectra*
- r.f. radiation 31
- statistics of green rays 35
- new observation method 36
- heating, hydrodynamics 794
- radio emission, mech. 4048
- eclipse observations in 6 374·5 Å rays 5033
- apparent effect of earth on activity 6693
- model in hydrostatic equilib. 6698
- green line intensity var. (1943–50) 6699
- interplanetary matter, classification 7459
- theory of structure 7469
- ion conc. in excited states 7470
- ion conc. in ground state 7471
- new line, 5 445 Å 7474
- continuous light, polarization recalc. 8457
- radio-astronomical invest. method 8458
- radial distrib. of monochromatic emission 5992–3

Corundum
- elastic constants 1479

Cosmic radiations, radio-frequency see also *Sun, radiation*
- radiation-absorbing centre in homog. universe 22
- radio astronomy, review 23
- galactic, cosmic rays as source 24, 5013
- cosmic-rays origin hypothesis 416
- review 792
- supernovae dust grains acceleration hypothesis 795
- galactic, 100 Mc/s survey 796
- galactic, discrete sources 797
- galactic structure 798
- galactic, 200 Mc/s, survey 799
- galactic radiation point sources, distance det. 800
- solar and galactic radio noise 1575, 8447
- from great nebula in Andromeda 1576
- sunspots and "star-spots" hypothesis 1577
- from discrete sources, effect of ionosphere 3271
- pole of galaxy, 205 Mc/s 3291
- possible primary shower source 3612
- galactic, fluctuations 4956
- origin and propagation in galaxy 6679
- origin of cosmic magnetic fields 6680
- magneto-ionic origin, theory 7125
- bibliography 7456
- 205 Mc/s, Cygnus A 7457
- radio-stars, analysis 8444
- Cygnus, variations 8445
- radio stars, survey 9234
- from "radio stars," diffraction in ionosphere 9621

Cosmic rays
- statistical analysis, stochastic processes 15
- as galactic radio emission source 24, 5013
- stratosphere invest. 1899
- electrodynamics, appl., textbook 2309
- particle ionization 2782
- energy degeneration calc. 2783
- particle mass measurements 3603
- main, and showers, origin similarity 4498
- use of neutrons as indicator 4500
- general text book 6295
- survey of existing problems 7989
- primary, energy distrib. 8001
- invest. at aeroplane altitudes 8811
- **absorption**
  - narrow air showers 436
  - star-producing radiation, variation 441
  - depth-intensity curve 450
  - intensity underground 453
  - absorption underground 454
  - nucleonic component 469
  - in atmosphere, due to meson-producing collisions 2783
  - in Pb, anomalies 3613
  - penetrating shower secondaries 3614
  - nucleon cascade 3792

Cosmic rays—*contd.*
- **absorption**—*contd.*
  - proton component 5518
  - penetrating showers 5530
  - burst producing radiation 11 500 ft 7052
  - stopped particles, cloud-chamber analysis 7053
  - in Pb, invest. 7054
  - in glacier at 3 550 m 7057
  - at high altitudes 8003
  - transition curve, 2nd max. 8817
  - shower-generating particles, in H and C, compared 8818
  - soft component, Pb, Al 8819
  - particles associated with stars, penetration 9572
  - heavily ionizing particles, transition effects 9576
  - hard-shower-producing radn., absorption length 9581
- **apparatus** see also *Cloud chambers*; *Counters*; *Counting circuits*; *Ionization chambers*; *Photography, particle tracks*
  - cloud chamber counter control 397–8
  - counter operation computation 421
  - magnetic spectrograph 439–40
  - electron-sensitive emulsions, background tracks 468
  - for stratospheric meson production study 479
  - anisotropy invest. with emulsion piles 1166
  - large ionization chamber 1881
  - meson detection by Cherenkov radiation 3047
  - special emulsions 4023
  - cloud-ionization chamber 4469
  - emulsion sensitivity, rel. to altitude 4510
  - radio link counter coincidences obs. 4511
  - cloud-chamber photography, triggering circuit 5502
  - radiosonde and telemetering system 5514
  - counter observation of bursts 5531
  - high altitude ionization chamber 5545
  - cosmic particles detection 5684
  - scintillation counter 6302–3, 9578
  - rocket invest., upper atmos. 6624
  - mass spectrometer 7951
  - external-cathode G.M. counter 9548
  - large cloud chamber 9557
- **composition**
  - hard component pos. excess 409–10
  - heavy nuclei 411, 1150, 5532
  - particles, momentum and sign det. 412
  - particle intensities and masses 415
  - Rossi curve shape 432
  - particles initiating penetrating showers 434
  - star energy distrib. 441
  - meson and nucleon components 456
  - track curvature invest. 467
  - primary spectrum (erratum) 1152
  - *N* component, mean free path 1902
  - charged particles, momentum distrib. 1905
  - development of nucleon component in air 1907
  - absence of light nuclei 2781
  - primaries as nucleons 2783
  - nuclear interaction length of shower particles 2796
  - hard component, stratosphere 3606
  - particles producing showers in Au 5520
  - primary rays Ne stripped nuclei 6296
  - V-particles decay 6297
  - scint. spectrum, 30 000 ft 6299
  - new unstable particles cloud-chamber study 6300
  - nucleon component development 7047
  - burst-producing radiation 7051–2
  - penetrating component intensity, high alt. 7991
  - neutral *V*-particles decay 7992, 8810
  - nucleon component development, av. nos. 7993
  - isolated tracks invest. 8010
  - soft and hard components ionizing particles spectrum 8813
  - shower-generating particles, disintegration 8814
  - penetrating secondaries production by mesons 8828
  - masses of particles 9568
  - star-producing radiation, scint. counter meas. 9578
  - rel. no. charged and uncharged particles, star production law 9580
- **alpha-particles**
  - from disintegrations at 29 000 m 2804
- **electrons**
  - cloud chamber investigation 419
  - from meson decay 634, 637

A complete list of the Subject Headings will be found at the end of the Index.

Cosmic rays—*contd.*
electrons—*contd.*
vertical intensity 1903
electron-photon showers transition, secondary max. 2795
electron/meson ratio 1100 ft underground 3604
hard-component, secondary, ang. distrib. 3617
distrib. in atmosphere 5517
shower, radial distrib. rel. to depth 5529
long-range, secondary, evidence 6298
electron cascades 7050
energy spectrum 8819
mesons
pos. excess, exp. and calc. 409–10, 471
π- and μ-meson prodn. spectra 413
intensity and masses 415
production in hard showers 424
λ-meson hypothesis 428
μ-meson underground 452
meson and nucleon component 456
spectrum as function of atmos. depth 461
shower multiplicities, nucleon absorption 473
production, spectrum and charge ratio 476
high-energy, production 477
slow mesons backward flux 480
production, review 631
electron production 634, 637
decay probabilities 635
fast protons in π-meson stars 636
production multiplicity and mass spectrum 471
multiple formation processes 472
pos. excess at sea level 474, 5516
ditto, 2000 m 8815
μ-mesons, pos./neg. ratio, sea-level 475
meson spectrum and meteorological variations 1151
differential range spectrum 1904
positive excess and E–W asymmetry 1915
collimated and wide-angle groups in star 1918
multiple production in single nucleon-nucleon collisions 2810
in photo plates under C absorbers 2815
underground, nuclear capture 2816
secondary radiation, nature 3046
detection by Cherenkov radiation 3047
energy spectrum deduction 3049
μ-meson mass 3603
electron/meson ratio 1100 ft underground 3604
hard component separation into μ-mesons and stable particles 3606
pluromultiple production model 3611
differential multiplicity of production 4494
ditto, integral 4495
production, rel. to upper atmos. temp. 4496
production by primaries 4755
distrib. in atmosphere 5517
ditto, latitude effect 9574
charge ratio of μ-mesons 5519
production, comparison of theories 5537
π-mesons from γ-rays, underground star prod. 5540
variation masses, reciprocity principle 5546
secondary, slow, origin in atmos. 5547
number of neutrons from stoppage in Pb 5737
π-mesons, pos./neg. ratio, stratosphere 6301
$(n, p; \pi^-)$ in emulsion 6467
range spectrum at sea-level 7048
burst-producing 7051–2
review 7058
zenith angle, momentum spectrum, sea level 8002
correl. of spectrum with barometer effect 8004
production, remarks 8011
multiple production evidence 8013
capture and decay in emulsions 8222
height of max. production 8827
penetrating component secondary to μ meson 8828
single meson prod. by γ-quanta 8987
masses of particles 9568
V^0-particle decay prod., ang. distrib. 9579
κ-particles decay 9721
τ-particles decay 9722
slow μ-mesons, absorption in emulsions 9723
neutrons
energy and density distrib. 1153
intensity, high-alt. lat.-dependence 1165

Cosmic rays—*contd.*
neutrons—*contd.*
neutron flux det. 1901
slow, distrib. up to 100 000 ft 3605
use as indicator 4500
intensity change after solar disturbances 4508
production at sea-level 4512
number in atmos., calc. 4513
neutron production studies, review 4516
in radiation from sun 5029
latitude effect 5535
rate of production in ice 5542
development including ionization losses 7047
production, sea-level and underground 8012
disintegration product in atmos., distrib. 8830
photons
spread in shower 430
in nuclear explosions and cascades 2806
primary gamma-radiation, search 4499
soft gamma-component 5515
ang. distrib. in showers in Pb 6304
local γ-rays at great depths 7990
protons
intensity and masses 415
fast, in π-meson stars 636
entry into atmosphere during aurora 2231, 4001–2
e.m. radiation in intense fields 4050
energy spectrum shape, rel. to Fermi's origin theory 4493
approach rel., aurora meas. 4955
momentum spectrum, absorption 5518
star-producing, altitude and latitude variation 5536
single tracks, neutron-induced 6311
development including ionization losses 7047
range spectrum at sea-level 7048
burst-producing, 11 500 ft 7052
possible origin of sun and galaxy radio noise 8447
effects see also *Nuclear reactions, cosmic rays*
light particles from disintegration, spectrum 462
star phenomena transition effect 463
nuclear disintegration cascades 464
neutral emission in stars 465
wide angle sprays 466, 2790–1
particle tracks, curvature invest. 467
nuclear evaporation 469, 600
ditto, comparison with known primaries 470
high-energy meson production 477
particles, nuclear interactions study 478
nuclear transmutations by high-energy particles 598
v. high-energy nuclear events 599
nature of emitted particles 601
meson production, review 631
low-energy electrons from mesons 637
events in emulsions underground 1169, 8824, 9684
double stars 1170
gamma-ray multipole electron-pair production 1296
hard-shower star, meson groups 1918
Be^8 decay energy invest. 2031
scintillations 2572
atmospheric element transmutation 2800
photograph reproductions 2801
coincidences invest. of bursts 2802
Li^8 nuclei in stars 2803
nuclear disintegrations at 29 000 m 2804
cascade processes, stratosphere 2805
nuclear explosions and cascade development, e.m. component 2806
counter coincidences, interpretation 2807
local penetrating events underground 2808
rare phenomena in emulsions 2809
stars, origin 2811
stars, energetic heavy particles emission 2812
disintegrations, Li^8 ejection 2813
Pb nuclei disintegration 2814
relativistic particle radiation in mag. field 3574
hard-component sec. electrons, ang. distrib. 3617
unusual nuclear event 3618
ang. distrib. of star prongs 3619
stars, radioactive nuclei emission 3620
nuclear disint. at high alt. 3621
pair production by fast electrons 3740
new unstable neutral particle 3793
multiple scattering in emulsions 4497

Cosmic rays—*contd.*
effects—*contd.*
Pb and Al nuclear interactions study 4514–15
meson production by primary rays 4755
meson and electron components, atmos. distrib. 5517
Au interactions of shower particles 5521
meson production 5537, 8011, 8013, 8827
high-energy nuclear evaporation 5538
underground, study 5539
underground stars, gamma-ray effect 5540
nuclear explosions, particles mean free path 5541
nucleon-nucleon collisions, emulsions 5543
stars in metal foils, emulsion studies 5544
ionization chamber bursts, high alt. 5545
transition effects in Pb 6310
secondary nucleons in Pb 6311
V-particle tracks 7056
in glacier at 3550 m 7057
nuclear interactions, review 7058
nuclear disintegration, invest. 7254
events in v. thick emulsions 8009
isolated tracks 8010
neutron production, sea-level and underground 8012
transition effect in Pb, stratosphere star-producing radiation 8014–15
nucleon cascades attenuation in Pb 8016
Dirac magnetic monopole creation 8516
h.p. cloud chamber study, 2740 m 8825
disintegration stars transition effects 8826
radioactive nuclei from stars 8829
U^{235} fission as source of error in geol. age det. 9188
evap. stars in metal foils 9577
star-producing radiation, scint. counter meas. 9578
cascade production of stars 9580
hard-shower-producing radn., absorpt. and collision lengths 9581
high energy event at 4550 m 9582
μ-meson-induced nuclear disintegrations 9685
origin
Fermi's hypothesis 416
ditto, development 414, 4493
relation to solar flares 417
radiation pressure theory 1900
gravitational theory 1906
review of theories 2780
absence of light nuclei 2781
variation phenomenon indication 6305
and propagation in galaxy 6679
Crab-nebula as point source 8446
experimental evidence 8812
review of problems 8820
showers and bursts
extensive showers radiation complex 418
cloud chamber studies 419, 422
penetrating particles distrib. 420
operation of coincidence counters, computation 421
production and multiplicity 423
nuclear interaction of secondary particles 424
nature of penetrating particles 425, 1160, 7994
penetrating, latitude effect 426, 8007
in stratosphere, structure 427
penetrating showers and particles, review 428
electro-nuclear, density transition 429
photon spread 430
angular and lateral distrib. functions 431
Rossi curve shape 432
N-component intensity and dist. 433
particles initiating 434
cascades, second moments 435
narrow showers, absorption 436, 2788
ditto, in Pb, rel. to stars 4505
penetrating component, altitude variation 437
electron-nuclear, altitude variation 438
altitude variation 458
wide-angle sprays 466, 2790–1
cascade theory, mean square deviation 1154
total flux origin in extensive showers 1155
nuclear origin, mixed shower 1156
many particles, Rossi curve 1157
cascade theory, stochastic treatment 1158
Rossi showers under thick screens, origin 1159
shielded-chamber bursts, alt. and lat. depend. 1167
cascade theory including ionization loss 1908*, 2794

Cosmic rays—*contd.*
showers and bursts—*contd.*
penetrating component cascade development 1909
extensive air showers at 3 500 m 1910
under thick absorbers, barometric effect 1911
N-component in extensive showers 1912
producers, collision mean free path 1913
difference equation method 1914
local hard showers, lat. and alt. dependence 1917
distrib. function, moment calc. 2779
anomalously large, structure 2784*
atmospheric, of $>$ 100 m width 2785
wide showers at sea level 2786
creation by unstable particles 2787, 7998
penetrating, in C and paraffin 2789, 426, 3607
penetration/spread correl. 2792, 7995
cascade theory, improved calc. 2793
electron-photon, transition curve sec. max. 2795
nuclear interaction length of particles 2796
coincidences invest. 2802
penetrating, in Pb and C, invest. 3607
atmospheric, density spectrum 3608
penetrating, from Li 3609
28 000 m in emulsion study 3610
high-energy, emulsions study 3611
primary, possible existence 3612
origin, similarity to that of main radiation 4498, 8821
Rossi 2nd and 3rd maxima 4501, 5524, 8817, 9570
and burst-corrected ionization, barom. and temp. freq. coeffs. 4502, 7049
extensive, density spectrum 4503, 8816
lateral structure, extensive showers 4503, 9571
delays of penetrating particles 4504
particle angular and radial distrib. 4506
rates, rel. to nucleonic cascades 4507
cross-section for prod. by μ-mesons 4756
in Au, particles producing 5520
Au interactions of particles 5521
shower particles absorption, statistics 5522
cascade showers, lateral and ang. distrib. 5523
narrow air showers, barom. coeff. 5525
extensive, transition effects 5526
cascade theory, recent calc. 5527
particles ang. dist., rel. to depth 5528
electrons radial dist., rel. to depth 5529
penetrating, absorption study 5530, 9569
nuclear bursts, counter observations 5531
electron cascades, fluctuations and general dist. problem 7050
large bursts, correl. with showers 7051
large bursts under thick absorbers, 11 500 ft 7052
angular spreading in heavy material 7996
extensive, separation of components 7997
particles, rel. arrival times 7999
penetrating, origin invest. 8000
diurnal var. at 3500 m 8008
nucleon cascades attenuation in Pb 8016
Molière function accuracy 8774
large air showers, daily var., bar. eff. 8822
theory of many-particle formation 9275
dense showers, 3500 m, diurnal var. 9575
variations
meson spectrum 1151
ionization and intensity above atmos. at equator 1164
theoretical geomag. effects, review 2799
rel. to natural radiocarbon distrib. 2935
rel. to radiosonde data errors 6308
sudden increase, limited area 8005
sudden increase (Oct. 1946) 8006
weather effect 8823
intensities rel. to isobar level heights 9573
between Australia and Japan 446
latitude effect on nucleonic component 449
latitude effect of stars 455
latitude effect at sea-level 1161
neutron intensity high-alt. lat. dependence 1165
stars in emulsions, latitude effect 1168
latitude effect, emulsion studies 5533
neutrons, latitude effect 5535
penetrating showers, latitude eff. 8007
meson atmos. distrib., lat. effect 9574
nuclear disint., altitude and latitude 5536
local hard showers lat. and alt. dependences 1917

A complete list of the Subject Headings will be found at the end of the Index.

Cosmic rays—*contd.*
  variations—*contd.*
    shielded-chamber bursts, alt. and lat. dependence 1167
    component variation with altitude and latitude 456
    directional and latitude survey, high altitudes 451
    alt. and lat. dependences at 9·15 km 444
    E–W asymmetry isolated tracks 442
    E–W effect in upper atmosphere 448
    penetrating component E–W asymmetry 1915
    E–W intensity fine structure, Lahore 5534
    anisotropy at high altitude 1166
    stratosphere ang. distrib. 447
    hard component zenith-angle dist. 445
    directional, at great depths 5539
    diurnal, primary radiation heavy nuclei 1916
    time variations 2797
    diurnal, search at balloon alt. 3615
    seasonal and diurnal, mechanism 6306
    diurnal, of extensive showers at 3500 m 8008
    time variation, review 8820
    diurnal, of dense showers, 3500 m 9575
    diurnal, directional meas. 6305
    barom. eff. and daily var., large showers 8822
    penetrating component of broad showers, altitude-variation 437
    electron-nuclear showers, with altitude 438
    increase of pos. effect with altitude 443
    high altitude absorption 457
    penetrating showers, altitude variation 458
    meson spectrum rel. to atm. depth 461
    intensity rel. to altitude 1163
    total and hard components, rel. to alt. 6307
    intensity rel. to atmospheric press. 1162
    showers under thick absorbers, barom. effect 1911
    bursts and ionization, barom. and temp. coeffs. 4502, 5525, 7049
    temperature and barometer effects 8004
    upper atmos, temp. effect 4496
    rel. to solar flares 417, 4509
    ditto, Nov. 19 (1949) 460
    star frequency increase after solar flare 459
    solar activity, indirect influence 2798
    correl. with radio fade outs 3616
    neutron intensity, after solar disturbances 4508
    rel. to sun's activity 6309
    correl. with aurorae 7055
Cosmogony see also *Elements, origin*
    n-body problem 1572
    origin and rel. abund. dist. of elements 2312
    radial retardation planetocentric effect 2313
    wave-mechanics variables discontinuity, effect 4108
    gravitating bodies system, evolution 8448
    neutron-capture element formation theory 9682
Cosmology
    general motion of matter 20, 2311
    expanding universe and relativity theory 21
    radiation-absorbing centre 22
    quantum theory astrophysical appl. 1568
    Hubble's expansion law interpretation 2310
    intergalactic matter and universe mean density 2316
    nebulae recession convection, Dirac eq. appl. 2343
    stationary closed universe impossibility 3316
    alternative time-dependences 4041
    extra-galactic nebulae distance scale 4042
    wave-mechanics variables discontinuity, effect 4108
    creation of matter theory and relativity 5010
    prestellar state of matter 5011
    theory and experiment, survey 5982
    time scale tests 5983
    new approach 8442
    increase of entropy in ∞ universe 9435
Counter tubes
    BF_3 proportional counters 384
    Ne-quenching, "late plateau" 385
    high-energy photon response 1878
    eff. for high-energy γ-rays 3583–4
    air proportional, design characteristics 4462
    X-ray counters, eff. 5486
    Bi type, quantum eff. 5488
    time-lag fluctuations effect 6273
    proportional, gas amplification coeff. rel. to incidence point 6274
Counter tubes—*contd.*
    background counting rate 7028
    localizing 7029
    γ-ray eff. wall-thickness dependence 7960
    Br-quenched, characteristics 7964
    directional properties 8348
    pulse-size and dead-time calc. 8792
    photoelectron counting sensitivity, pressure-dependence 8793
    thin end window, factors affecting stability 9542
    self-quenching, characteristics, temp. depend. 1120
    progress in France 3595
    theory and appl., review 1124
    effect of temp. 7978
    alcohol-argon filled temp. variations 1877
    A counters, pulses 1879
    end-window, development 4466
    proportional, graphite-coating electrodes 386
    external cathode, hard-glass 6278
  accessories see also *Counting circuits*; *Radiation monitoring*
    portable survey equipment 3592, 4467
    proportional counters, electronic equip. 4468
    gas flow, automatic sample changer 5491
    theory of voltage stabilizers 7971
    high-voltage pulse generator 7974
    amplifiers, stabilizers, review 9556
  construction
    long-beaded, for X-ray meas. 1122
    mounting for gas-phase counting 2765
    proportional counters 3585
    Ni foil window 5816
    end-window, optimum length 7965
    6-anode anticoincidence tube 7967
    loop-line, windowless flow 8794
    Pyrex, externally coated 9541
    toroidal 9544
    circular 9547
    external-cathode 9548
  discharge mechanism
    with external electrode 1121
    Geiger point counter, electron emission 2657
    vapour-filled counters, "giant" pulses 2762
    temperature effect 2763, 5490
    ditto, spurious counts 7962
    discharge-spread region 4463
    NH_3-filled tubes 5485
    slow counter 5489
    large-pulse, in pure vapour-filled counters 6275
    low-voltage, halogen-quenched, time-delays 6277
    plateau slope meas. 6279
  operation technique see also *Counters, operation technique*; *Counting circuits*; *Statistical analysis, counters*
    delayed coincidences, effect of time-lag 394*
    coincidence absorption studies 579
    scintillation counting 1883
    electron absorption by nylon and formvar windows 2748
    geometry of 2-tube telescope 2764
    proportional counters 3585
    end effects elimination 4459
    spurious counts, successive peaks 4460
    containing CO_2, improvement 5487
    gas, precision meas. 5692
    end-window, geometry calc. 4461, 7966
    integrating method for β-spectra 8157
    coincidence meas. of decay consts. 8159
    directional effect 9543
    electron transit time invest. 9545
    for liquids, effects of soln. composition 9546
  special applications
    cloud chamber control 397–8
    counting scintillations 1128–9, 1883–4, 3589
    electron-capture-rate meas. 1274
    photosensitive, appl. 3582, 7961
    for gaseous counting of T 3718
    compared with ion-chamber for γ-ray meas. 3751
    in X-ray diffract. 4415
    radio link for cosmic-ray coincidences obs. 4511
    X-ray spectrometer 7000
    H^3 assay by CH_4^3 counting 7201

A complete list of the Subject Headings will be found at the end of the Index.

Counter tubes—*contd.*
  special applications—*contd.*
    G.M., for X-ray meas. 7963
    ditto, long-beaded tube 1122
    in aerial prospecting 9844
Counters see also *Counter tubes*; *Ionization chambers*
    theory and appl., review 1124
    spark, characteristics 2768
    α-particle, for students 3586
    progress in France 3595
    Cherenkov, for fast electrons 4426
    automatic plate sorter 8801
    4π, for standardization 9648
  crystal
    diamond, electron and hole mobility 389
    natural Greenockite (CdS) X-ray detector 390
    theory and appl., review 1124
    props. of diamond 1125
    electrons released by α-rays in NaCl 1126
    AgBr appl. 5495
    diamond, space-charge behaviour 7032
    diamond, space-charge-free, β-rays 7033
    diamond, mobility, energy, etc. 8795
    integrating, for high-energy photons and particles 8796
  scintillation
    suitable liquids or solutions 212, 6280
    liquid scintillator eff. det. 214
    solutions and crystals, spectra 221
    proton energy meas. 391
    anthracene, efficiency 985
    ditto, slow β-rays 1127, 2766
    theory and appl., review 1124
    using photo-sens. G.M. counter 1128–9, 1883–4, 3589
    multiplier phototube use 1130
    non-cryst. phosphors 1750, 7035
    gamma-ray energies meas. 1885
    NaI(Tl), X- and γ-rays 2020–1, 3591
    decay times 2571
    coincidence spectrometer 2767
    decay times, u.v. and γ-ray excited cryst. 3450
    α-bombarded thin films 3462
    alpha-counter, U and Th est. appl. 3587
    resolving time, statistical limitations 3588
    directional, for clinical meas. 3590
    phosphor-plastic systems, invest. 4294
    anthracene, electron energy studies 4470
    for fast neutrons 5496, 7969
    proportional counter appl. 5497
    anthracene response to $< 3\cdot7$ MeV protons 5498
    anthracene, neutron detection 5809
    anthracene, deterioration 6140
    liquid, addition of specified elements 6281
    for cosmic-ray meas. 6302
    cosmic-ray heavy nuclei meas. 6303
    LiI–TlI, slow neutrons detect. 6481
    organic phosphors 6882, 8797, 9393
    response to heavy particles 6893
    fluorescence eff., electrons, heavy particles 6894
    review 7034, 7970
    brain needle appl. 7037
    Venetian-blind photomultiplier 7038
    for thermal neutrons 8798
    for X-ray intensity meas. 8799
    for *in vivo* localizations 8800
    props. and uses, review 9550
    for clinical use 9551
    in aerial prospecting 9844
  operation technique see also *Counter tubes, operation technique*; *Counting circuits*; *Statistical analysis, counters*
    multi-stage fluorescence radiance amplification 6135
    efficiency criteria 9649
Counting circuits
    new high-resolving-power arrangement 392
    for random coincidence rates 393
    99-channel analyser 395
    portable pulse generator 396
    magnetic cosmic-ray spectrograph 439–40
    equipment, review 1124
    μsec pulse amplitude chart-recording 1131
    high-speed, short resolving time, for scintillation counters 1132
    resolving time meas. device 1133

Counting circuits—*contd.*
    differential pulse height analyser 1134, 1636
    self-triggering, for cloud-chamber 1886
    pentode scalers 1888
    pulse integrators 2769
    magnetic scaler 2770
    freq. mod. detector as coincidence counter 2771
    multivibrator, high resolving-power for coincidences 2772
    single-channel pulse analyser 2773, 4477
    10-channel time discriminator 3354
    progress in France 3595
    quenching circuit 3718
    for scint. counters 4471
    coincidence meas. 4472
    distributed coincidence circuit 4473
    zero ineff. anticoincidence circuit 4474
    high-accuracy counting-rate meter 4475
    Johnson's quenching, analysis 5499
    delayed coincidence, for scintillation counters 5500
    binary, impulse-controlled 5501
    mains noise interference 6283
    cascaded binary counter with feedback 6284
    new high resolution coincidence circuit 7039
    direct-reading rate recorder 7972
    comprehensive system of common sub-units 7973, 9553–4
    mechanical pulse-size analyser 7975
    pulse height analyser 7976
    ultrasonic delay-line 7977
    pulse spectrograph 8802
    coincidence, use of gated-beam tubes 8803
    review 9556
Cracking see *Fracture*
Creation of electron pairs see *Electrons*
Creep see also *Slip*
    deformation in metals 688
    metals, at high temps. 1374
    in precipitation-hardened alloy 1376
    Cd crystals, surface effects 1377
    dielectric polymers 1378–9
    steady phase, empirical temp. rel. 2109
    high-purity Cu 2110
    visco-elastic behaviour 3094–5
    Boltzmann's superposition theory appl. 3830
    in alloys, A.E.C. invest. 4770
    transient, in Ni 4794
    nonclassical reaction kinetics 4806
    Au wire at high temp. 4807
    Pb and Cu single crystals 5832
    graphite, high-temp. 5833
    Cu, delayed fracture 5837
    high purity Al 5838
    cell mechanism and boundary micro-flow 5839
    metals (book) 6515
    polycryst. Pb, surface effect 6516
    dislocations effect, in cryst. plasticity 6569
    rocks, rel. to earthquakes 6607
    inductive pick-ups meas. 6766
    transient, in pure metals 7327
    rel. to relaxation 8273
    and stress rupture as rate processes 9033
    metals, dislocation theory 9748
    steel, grain-boundary theory 9750
Critical constants, thermal
    H_2, HD, D_2 mixtures, individual components 878
    critical phenomena, review 1798
    1-1 electrolytes, rel. to soln. compn. 1800
    H isotopes 4333
    critical point thermodynamics 6939
    critical phenomena, theory 7812–13
    He I λ point and triple point 8708
    behaviour of gas solutions 9424
    neopentane 6923
    CO_2-ethylene, "conformal solns." appl. 9322
    CO_2-ethylene and CO_2-propylene 9756
Cryolite
    thin film, refractive index 2575
Cryoscopy see *Freezing*; *Low temperature*
Crystal chemistry
    binary fatty acids cryst. spacings 8364
    tetragonal metaborates 9156
Crystal counters see *Counters, crystal*

A complete list of the Subject Headings will be found at the end of the Index.

Crystal properties
catalytic hydrogenation over oriented films, parameter effect 1407
technique for manipulation of BaO 7377
alkali halides, Po α-rays range 8788
electrical see also *Counters, crystal*; *Piezoelectricity*
piezo-electric equations of state 142–3
piezo-electric crystals, ultrasonics appl. 302
Debye modes and superconductivity 321
ionic conductivity, theory 735
deformation potentials and mobilities, non-polar crystals 1057
electron scattering in large fields 1108
Rehbinder effect invest. 2112
ionic crystals, diel. const., review 2666
ditto, diel. const., rel. to press. 5393
ditto, dielectric breakdown 8757
rectifiers, h.f. diffusion theory 2691
effect of mechanical resistance 2849
lattice defect theory, semi-conductors 3518
alkali and halide ions, revised diel. parameters 3899
irradiation activities 4288
exciton-enhanced photoelec. emission, mech. 4392
ion polarizabilities, perovskite-type crystals 4901
antiferroelectric, theory 5386
charge distrib., Fourier synthesis invest. 5916
photoconductivity, ionization mech. 6136
water of cryst., diel. props. 6196
Benedicks effect in fine-cryst. metal waves 6232
photocond., surface cond. 6886
ferroelectricity, review 6947
trap density, electron hole energy, diamond 7033
effective field strength, cubic crystals 7833
static diel. const. of dipolar solids 7834, 8712
ferroelectric crystals domain boundary motion and h.f. diel. const. 7836
polycrystalline dielectrics 7842
oxidic semiconductors 7865
some sulphides, selenides and tellurides 7885
oxide cathode, X-ray diff. study 8808
neutron crystal monochromators 9006
diel. const. var. with pressure 9448
superconductivity rel. to struct. 9492
AgBr counters 5495
AgBr, elec. conductivity 9464–5
AgCl, electrons and holes motion 7864
alkali halides conductivity, plastic flow influence 1477
alkali halides, photoelectric current rel. to time 1844
alkali halide *V*-centres 2522
alkali halide, diel. dispersion 2671
irradiated alkali halides 7863
alkali halide, current noise and diel. breakdown 8759
BaO semiconduction and photoconduction 7693, 7884
BaTiO$_3$, O displacement theory 1042
ceramic BaTiO$_3$ electromech. oscillations 2677
BaTiO$_3$, single-domain, electromech. response 2678
BaTiO$_3$ conductivity discontinuities 3517
hexagonal BaTiO$_3$, Lorentz convection 7841
BaTiO$_3$, domain structure, transitions, properties 8711
new varieties of BaTiO$_3$ 9807
Bi, resistance in magnetic fields 4562–3, 5620, 8076
CdS, elec. conduc., α-irradiation effect 5298
CdS photoconductivity, low temp. 5415
Cu$_3$Au thermo-elect. power, transformation process effect 1855
KCl, coloured, with impurities 194
KCl conductivity, activation energy 8728
KCl and AgCl mixed cryst., dielec. breakdown 8758
KH$_2$PO$_4$ group, electro-optical invest. 297
K niobate, diel. props. 5394
(La, Sr) MnO$_3$ 7866
Li halide, ionic conductivity 1482
magnetite conductivity, temp.-effect 5403
magnetite single cryst. 8831
MgSO$_4$.7H$_2$O nuclei, orientation in electric field 2156
NaCl, α-particle-released electron currents 1126
Na niobate, diel. props. 5394
alpha- and beta-quartz piezoelectric constants 1823
quartz blanks, aging 1824
quartz piezo-electric cryst., elec. const. det. 9455

Crystal properties—*contd.*
electrical—*contd.*
Rochelle salt domain structure 1041
ditto, ferro-electric props., purification effect 2668
Se single crystal, Hall effect 2875
Se, temperature effects 6208
Se single crystals, properties 6975
Te, Ettingshausen–Nernst effect 4565–6
Ti single crystals 3526
Tl halide, p.e. sensitivity 8738
WO$_3$ 2672
zincblende, electron-bombardment-induced currents 2751
ZnS piezoelectric const. calc. 5398
magnetic see also *Paramagnetic resonance absorption*
antiferromag. compds., deformations in structure 492
antiferromagnetism ordering effect 1921
structural changes in antiferromag. compds. 4529
antiferromagnetism in single crystal 6346
antiferromag., critical field curve 8835
Alnico, anisotropy const. 494
ditto, precipitation and domain struct. 4527
ferromagnetics, magnetization, reversible suscept. 506, 1938
ferromag. domain boundary, propag. vel. 2824
ditto, inertia 2834
ferromagnetics, Goldhammer's effect 3673
nuclear electric quadrupole interactions 548
magnetic anisotropy, general account 745
ditto, quantum theory 6318
de Haas–van Alphen effect, Ga, Sn, graphite 1176
ditto, Cd, Be, Mg, Sn, In 9601
nuclear effects, v. low temp. 9602
ferrospinels, r.f. appl. 1179
Weiss ferromagnetism theory, limits 2823
magnetostriction, elastic tensions effect 3674
single-crystal domain wall movement 5889
ferrites, review 6338, 8031
paramag. crystals, dipolar domains 7070
Co ammonium sulphate, 1°K 5582
Co–Cu and FeNi–Cu 1923
Co–Ni domain structure 507
Fe single crystal, magnetostriction magneto-thermoelectricity rel. 1854
ditto, neutron scattering and polarization 2069
Fe–Co alloy single crystal magnetostriction const. 1956
αFe$_2$O$_3$, single-crystal anisotropy 6333
Fe–Si single crystals, hysteresis curves 1186
ditto, domain structure 5588
Fe–Si magneto-resistance 1954
Ni and Fe–Si, magnetization effect on ultrasonic attenuation 7636
In single crystals 2827
LiF single crystal spin relaxation times 3633
magnetite, electrical conductivity temp. dependence 1829
ditto, single crystal 8831
ditto, microwave resonance absorption 8027–8
mica anisotropy 3637
Mn perovskite-struct. compds. 6335
MnBi ferromag./antiferromag. transition 5565
MnF$_2$, anisotropy 2836
MnF$_2$, nuclear mag. resonance 3640
Ni, energetic anisotropy 2829
Ni domain patterns 4536, 8043–4
Ni bicrystals, ferromag. domains 5560
Ni, magnetostriction 5624
Ni ferrite ferromag. resonance 1929
α–NiSO$_4$. 6H$_2$O anisotropy 2835
Ti single crystals 3526
Zn, Be anisotropy 488
Zn$_{0·55}$ Mn$_{0·45}$ Fe$_2$O$_4$, magnetic anisotropy 4520
mechanical see also *Piezoelectricity*
piezo-electric equations of state 142–3
hardness in metals 664
single crystal, ultrasonic meas. 670
dislocations, multiplication processes 673
prismatic dislocations 737
prismatic punching 738
metal single crystal surface structure 746
slip-band formation, interferometer invest. 991
cubic crystals, elastic const. det. 1363, 9132

A complete list of the Subject Headings will be found at the end of the Index.

Crystal properties—*contd.*
  mechanical—*contd.*
    rupture mechanisms in metals 1366
    metals, deformation textures 1373
    metals, deformation, review 1374
    transient creep, Mott–Nabarro theory 1376
    cubic nitrates elastic constants 1478
    ultrasonic waves in polycrystals 1669
    plastic crystals, optical surface machining 2075
    boundary energies in metals 2077
    dislocations, forces and stress fields 2094
    breakdown characteristics, theory 2102
    ionic crystals, compressibility and absorption freq. 2104
    microhardness single crystals, rel. to indenter orientation 2111
    Rehbinder effect invest. 2112
    compressibility/resonant freq. rel. 2162
    metals cold-rolling, resistivity anisotropy 2680
    X-ray abrasion studies 2722
    effect on electrical characteristics 2849
    surface tension of faces 3057
    piezo- and ferro-electric crystals, elastic constants 3089
    resolved shear stress law 3092
    crystal plates, flexural vibrations 3406
    interference obs. of vibrations 3407, 8590
    elastic tensions effect on magnetostriction 3674
    body-centred alloy modulus, superlattice effect 3816
    single-crystal deformation, recovery 3826
    effect of vibrations on X-ray diffraction 4208
    optical materials 4229
    contour vibrations of square plates 5174
    fatigue mechanism, metals 5834
    elasticity, atomic theory 6503
    plastic deformation in surface-active media 6511
    real crystals, dislocations 6564
    dislocations as lattice props. 6569
    elasticity, atomic displacement treatment 7313
    metal physics progress 7439
    beta-brass elastic parameters, composition dependence 8260
    body-centred cubic metals, deformation textures 9030
    elastic consts. from diffuse X-ray reflections 9131
    interaction of sound wave and dislocation 9344
    Ag lattice and grain-boundary self-diffusion 5815
    Al, discontinuous elongation 3093
    Al, strain rate effect on plastic deform. 9029
    ammonium phosphomolybdate, adsorptive props. 8314–15
    $BaTiO_3$, ceramic, electromech. oscillations 2677
    $BaTiO_3$, single-domain, electromech. response 2678
    Cd, surface effects in creep 1377
    natural corundum, elastic constants 1479
    Cu single crystals, internal friction freq. and temp. dependence 1385
    Cu single crystal N absorption, anisotropy 3166
    Cu and Fe, abrasion deformation 3190
    Cu, cold worked, internal friction 9040
    diamonds, photo-elastic invest. 100
    type II diamonds, laminations 4896
    α–Fe, yield phenomenon and twinning 7321
    LiF, calc. 3681
    Mg and Zn sulphate, elastic constants 671
    molybdenite prismatic cleavage 1489
    $(NH_4)_3AsO_4$ elastic compliances 2157
    Ni magnetostriction 5624
    Pb, polycryst., creep surface effect 6516
    Pb and Cu, single-crystal plastic deformation 5832
    X-cut quartz, sound field 155
    quartz vibrators (book) 2459
    quartz oscillator-plates manufacture 2676
    quartz elastic modulus, rel. to thickness 3087
    zero temp.-coeff. quartz 7371
    "piezocrescence" in quartz 8335
    Rochelle salt, mech. twinning 3191
    Rochelle salt h.p. moulding for crystal plates 3900
    Sn, white, twinning 1484
    Zn, deformed grain structure 2100
    ZnS piezoelectric const. calc. 5398
  optical see also *Counters, scintillation*; *Luminescence*; *Raman spectra*
    ionic crystals, polaron state 736

Crystal properties—*contd.*
  optical—*contd.*
    Raman lines, frequency variation with direction 979
    colour sensitivity parallel Nicols 994
    anisotropic wave propagation 1667
    Rayleigh scattering calc. 1774
    Raman and i.r. lines intensities 2562
    space-group C^5_{2h}, scattering spectra 2565
    polarizability, alkali and halide ion parameters 3899
    irradiation activities 4288
    mix-crystals vibration spectrum 4574
    rare-earth and benzene spectra, energy levels 4902
    planar complexes, dichroism 5290–1
    birefring., thermal light-scattering 5329
    sensitive colour rel. to colour temp. 5336
    Raman spectral analysis appl., review 6138
    monocrystals light scattering 6152
    optical activity theory 6154
    exciton theory 6221
    ionic crystals, optical waves rel. to latt. vibr. 6565
    mixed crystals i.r. and Raman spectra interpretation 6857
    luminescence, nature of 6886
    cubic crystals anisotropy under quadrupole radiation 7369
    aromatic monocrystals, Raman spectrum 7770
    chromatic polarization, sensitive colour 7786
    semiconductors 7856
    opt. active compds. abs. configuration det. 9160
    absorption due to 2 valency states interaction 9370
    AgCl refractive indices, visible and i.r. 175
    Ag halide layers, absorption 1764
    Ag halides, internal photo-effect and light absorption 7899
    AgI internal photo-effect, selectivity 9222
    alkali halides darkenability, plastic flow influence 1477
    abs. spectra of pure and coloured alkali halides 6856
    alkali-halide α- and β-bands oscillator strengths 8635
    BaO, absorption, photoconduction, 7693, 7884
    $BaTiO_3$, single-domain crystals 8711
    ditto, new varieties 9807
    benzene, absorption spectrum, low temp. effects 4259
    beryl, colour 6559
    $CaCl_2 . 4H_2O$, constants 3187
    chrome alum, absorption spectra 8634
    chrysene 9162
    CsBr, transmittance 5266
    diamond, photo-elasticity 996
    $Fe(OH)_2$ colour change on oxidation 9371
    galena, infra-red transmission 6858
    KCl, coloured, absorption spectra 194
    $KClO_3$, colour of crystals 9409
    KHF_2 i.r. reflection spectrum 6124
    labradorite iridescence 733
    LiF refractive index, temp.-dependence 933
    MgO refractive index, temp. variation 934
    MgO, induced absorption bands 1746
    MgO additive colouring 7370
    moonstone 1474
    NH_4NO_3, $TlNO_3$, $Pb(NO_3)_2$, i.r. spectra, polarized light, low temp. 196–7
    Na metaborate dihydrate 8357
    Na stannate 5924
    quartz and corundum, u.v. absorption spectra 2525
    quartz, Brillouin scattered components 2583
    ditto, thermal scattering 238
    quartz opt. rotation, i.r. to 9·7 μ 4314
    quartz, X-ray colour centres 6558
    rocksalt crystal discoloration 734*
    ditto, *K* absorption band studies 6134
    rubies, colour 1475
    Se single crystals 9361
    sphalerite, rutile, refr. index 6557
    SrO, BaO photoelectric changes due to u.v. irradiation 1845
    stilbene cryst., fluorescence and absorption 9390
    Ti anodic oxidation colours 3075
    Tl halide, opt. absorption 8738
    WO_3 2672
    Zn light figures 4889

- **Crystal properties**—*contd.*
  - **thermal**
    - entropy, transition temp., sp. ht., approximation method 748
    - disorder increase, effect on catalysis 2123
    - conductivity, meas. method 2599
    - solid alcohols, anomalous sp. ht. and molec. rotation 2642
    - optical materials 4229
    - crystal surfaces, free energies 4900
    - effect of gas adsorption on fusion 6544
    - conductivities, low temp. 7802–3
    - conductivity of diel. crystals 9416
    - AgCl, LiF, MgO, expansion 3189
    - barium dicalcium-propionate transition 7806
    - benzene, entropy calc. 5375
    - order-disorder temp. dependence, beta-brass and Cu_3Au 3910
    - chrysene 9162
    - Cu thermal dilatation, isotropy 2606
    - Cu–Mn alloy system 3067
    - KCl–KBr, configurational contrib. to heat capac. 5627
    - KCl–KBr, heat of formation 5633–7
    - magnetite and fluorite, expansion 1476
    - NH_4Cl and NH_4Br, thermal expansion 3188
    - Na metaborate dihydrate 8357
    - phase transition in NaCN and KCN 6567
    - Na stannate 5924
    - *p*-nitroaniline and *p*-dinitrobenzene, thermal expansion 8685
    - yellow *P* low-temp. transition 4338
    - quartz conductivity, low temp., neutron irrad. effect 1793
    - α-monoclinic Se thermal expansion coeffs. 8684
    - Teflon room-temp. transition study 7807
- **Crystal structure** see also *Polymorphism*
  - intrinsic cryst. structure of metals 3676
  - Na stannate 5924
  - SiC vicinal faces 7372
  - simple goniograph 8333
  - mosaic, microbeam invest. 8348
  - $NaBO_2 . 2H_2O$ 8357
  - K and Na niobate 9123
  - chrysene 9162
- **Crystal structure, molecular** see also *Crystals, electron states*; *Crystals, lattice dynamics*; *Electron diffraction crystallography*; *Neutron diffraction crystallography*; *X-ray crystallography*
  - structure, interpretation from adsorption phenomena 1450
  - space group designation by tables of characters 1483
  - relations among structure factors 1490
  - space groups vector representation tables 1495
  - ideal paracrystal 3198
  - rel. to symmetrized Patterson function 3207
  - molecular crystals, electronic energy levels 4902
  - inner potential meas. and calc. 5931–2
  - Raman spectral analysis appl., review 6138
  - monocrystals light scattering, intrinsic block struct. 6152
  - low-temp., i.r. spectra 7723
  - uni-molec. steps, microscopic obs. 8344
  - choice of triclinic lattice elements 9805
  - vector models 9816
  - **elements**
    - inert gas hydrates, structure 5907
    - rare gases, atom. interaction 6373
    - Au, precision meas. 6602
    - Be allotropic forms 753, 8354
    - Co phase transformation 3908
    - diamond, rel. to luminescence 969
    - graphite, symmetry 1498
    - graphite, X-ray and neutron diffraction 3208
    - rhombohedral and orthorhombic graphite, possible identity 4899
    - graphite oxide soot 6497
    - graphitic C 6580
    - Ga anisotropy 2163
    - yellow P, low temp. transition 4338
    - Pt, Ta, Nb, Mo, high-temp. 4908
    - α-monoclinic Se 3924
    - Sn lattice constant 752

- **Crystal structure, molecular**—*contd.*
  - **elements**—*contd.*
    - β-Ti lattice det. at 900°c 3209
    - U structures 9143
    - U β-phase 9144
  - **inorganic compounds**
    - antiferromag. Curie temp. transitions 492, 4529, 5569
    - phosphors, peripheral layers 3452
    - ferrites, review 6338, 8031
    - ferrites crystallography 6351
    - inorg. crystals, adsorbed water layers 8714
    - AgBr, lattice defects 5921
    - Ag–Mg alloys, α phase, superstructure 1355
    - short-range order in Ag–Au 4784
    - ζ-phase struct., Ag–Zn system 9146
    - alkali halides, impurities distrib., 5900
    - alk. halides, precision meas. 6602
    - apatites 1511
    - N-austenite and N-martensite 8407
    - $B_{10}H_{14}$ 1500
    - $BaBi_4Ti_4O_{15}$ 1512
    - $Ba(ClO_3)_2H_2O$ 9150
    - bandylite 6594
    - $BaTiO_3$ atomic positions and vibrations 1506
    - $BaTiO_3$ and $Pb/BaTiO_3$ 3211
    - $BaTiO_3$, low temp. twinning 3903
    - $BaTiO_3$, high-temp. changes 8358
    - beryl parameters 750
    - $BiNbO_4$, $BiTaO_4$, $BiSbO_4$ 6593
    - $BiONO_3 . H_2O$ 6586
    - boracite 9147
    - boroferrites 1510
    - $CaO_2 . 8H_2O$ 2179
    - $2CaO . (Fe, Al)_2O_3$ 9153
    - CeOF, lattice structure 1505
    - chlorites, ordered polymorphic structures 1485
    - orthorhombic chrysotile 3937
    - sigma-phase in Co–Cr system 3912
    - Co_2Al_9 3927
    - Co_2C 9831
    - $Co(NH_3)_6TlCl_6$ and $Co(NH_3)_6TlBr_6$1508
    - CoO, changes near Curie temp. 492
    - $CoSi_2$ 754
    - CrB 2177
    - Cr_2O_3, changes near Curie temp. 492, 9597
    - CsCl thermal transition 8356
    - Cu_3Au, beta-brass, long-range order 3910
    - $CuAu_3$ superlattice 6485
    - $CuMg_2$ 4909
    - $Cu(NO_3)_2 . 3Cu(OH)_2$ 1509
    - cyanamide 3212
    - D_2O ice 3948
    - dolomite thermal decomp. study 7391
    - $Eu(BrO_3)_3 . 9H_2O$ 4255
    - $EuCl_3 . 6H_2O$ 4254
    - $FeBr_3$ 3925
    - σ–FeCr, space group 5919
    - Fe lazulite 9155
    - α''-Fe nitride 8408
    - FeO rhombohedral deformation 4529
    - galena, new elastic constants 8259
    - HCN 9151
    - $(H_3C)_3N–BF_3$ 9172
    - $HClO_4 . H_2O$, proton magnetic resonance absorpt. invest. 8843
    - $H_3N–BF_3$ 9171
    - anhydrous HNO_3 3931
    - $HNO_3 . 3HO_2$ 5926
    - $HNO_3 . H_2O$ 6590
    - H_2O in inert gas hydrates 5907
    - H_2O_2 2176
    - H_2S and D_2S, spectrum vibrational assign. 5269
    - H_2SeO_4, selenic acid 5925
    - $HgNH_2Cl$ 6591
    - $Hg_2NOH . 2H_2O$ 3935
    - hydrazine 2175
    - hydrazonium sulphate, orthorhombic 9154
    - IBr 5920
    - K dioxalatodiaquo-chromiate 2182
    - KCl coloured crystals 194
    - KCl, density change with bivalent ion addition 1473
    - KCl–KBr, ageing study 6568
    - KCl–RbCl, from aq. soln. 6581

Crystal structure, molecular—*contd.*
  inorganic compounds—*contd.*
    K_2CuCl_4 and $(NH_4)_2CuCl_4$, hydrated, microwave resonance spectra 7092
    $KF . 2H_2O$ 3928
    $KHCO_3$ 984
    tetragonal $K_2O . 4WO_3$ 755
    KSb_4F_{13} and isomorphous compds. 3933
    La and Pr ferrites 6592
    lanarkite 9158
    LiF, quantum mechanics 3681
    $LiFePO_4$ 1504
    LiH 9833
    $Li_2SO_4 . H_2O$, nucl. mag. reson. study 9634
    ludlamite 9157
    magnetite structure transition 9596
    malachite, re-examination 6587
    tetragonal metaborates 9156
    Mn compds. with perovskite struct. 6335
    MnF_2 1501
    Mn dioxides 4864
    MoF_3 and TaF_3 6583
    MoO_2 promoted catalyst 1399
    moonstone 1474
    NH_4Cl, neutron diffraction 7394
    NH_4NO_3, $TlNO_3$, i.r. spectra, polarized light 196
    NH_4NO_3, $TlNO_3$, $Pb(NO_3)_2$ i.r. spectra, low temp. 197
    $(NH_4)_4P_4O_{12}$ 3930
    NH_4VO_3, unit cell and space group 1503
    $NaAlCl_4$ 6588
    $NaBO_2 . 2H_2O$ 8357
    $NaK_5Cl_2(S_2O_6)_2$, $NaK_2Cl(S_2O_6)$ 9836
    $NaPt_3O_4$ 4910
    Na stannate 5924
    Ni–Co alloys 749
    NiAs, Ni_2In, rel. to orthorhombic structures 9829
    $NiMg_2$ and $AuMg_3$ 9145
    $NiO . 3BaO$, $NiO . BaO$, $BaNiO_3$ and intermediate phases; NiO 3932
    NiSi 9148
    niobates, tantalates 2180, 9152
    nitrite ion dimensions 9832
    oxyfluorides, *X*OF 6589
    $PbBi_2S_4$ 3934
    $PbMnO_2OH$ 1507
    Pb oxides and fluorides studies, review 1499
    $PbTiO_3$ phase transition 3929
    Pb zirconate phase transition 2178, 9149
    $PbZrO_3$ antiferroelectric struct. 9835
    plagioclase felspars 2183
    PtO_2 8355
    $PtPb_4$ 9830
    quartz faces, development and surface energy 1513
    quartz lattice parameters 3205
    RbBr, polymorphism 4891
    rubies, colour theory 1475
    rutile 3918
    SO_2 5923
    SiC, symmetry contradiction 3926
    sulphamic acid 8359
    $Th(OH)_2SO_4$ 2181
    Ti_3O_5 (anosovite) 6582
    tourmaline 3936, 9159
    UH_3 by neutron diffraction 9838
    uraninites, as measure of age 9834
    VF_3 6584
    valentinite and complex Sb (III) fluorides 6595
    WO_3 domain structure 2672
    WO_3 phase transition 6585
    ZnO lattice constants 1502
    ZnO smoke, electron diff. patterns 8254
    $ZnSO_4 . 7H_2O$ and $. 6H_2O$ 2646
    $ZnSO_4 . 7H_2O$, low temp. 2647
  organic compounds
    proteins, polypeptide chains 526
    hydrated proteins, vector maps 1497
    $KNaC_4H_4O_6 . 4H_2O$ 1514
    hexamethylenediamine 1515
    phenanthrene 1516
    syn p-chlorobenzaldoxime 1517
    Rb benzyl penicillin 2174
    thiophthen, central bond length 2184

Crystal structure, molecular—*contd.*
  organic compounds—*contd.*
    crystalline proteins 2185
    polyethylene crystallinity temp. rel. 2186
    cysteylglycine-sodium iodide 2187
    diastereomeric 1-chloromercuri-2-methoxycyclo hexanes 2188
    β-isoprene sulphone 2189
    para-di-chloro-benzene 2563
    molecular rotation 2642
    temperature-variation in homologous series 2722
    synthetic polypeptides 3171
    colchicene and Cu salt 3213
    cellulose, i.r. absorption spectrum study 3441
    "sub-cell" of long chain cpds. 3922
    adenine hydrochloride 3938
    guanine hydrochloride 3939
    p-aminophenol 3940
    hydrate racemic acid 3941
    tobacco necrosis protein 3942
    octachlorocyclobutane 3943
    p-di-tertiary-butylbenzene 3944
    citrinin 3945
    ethylene diamine tartrate 3946
    polyethylenes, rel. to temp. 4911
    synthetic polypeptides 5889
    adipic acid, by polarized i.r. 5909
    sodium tartrate 5927
    mandelic acids 5928
    piaselenole, piazthole and benzofurazane 6596
    strychnine hydrogen bromide 6597
    strychnine sulphate pentahydrate 6598
    thyroxine 6599
    solid hydrocarbons, nuclear resonance 7164
    phthalocyanine molecule, optical methods appl. 7385
    ribonuclease 7392
    Ba di-Ca propionate phase transition 7806
    cupric tropolone 8360
    saccharin and Mn^{++}, Ni^{++} and Co^{++} derivs. 8361
    44′-dihydroxydiphenyl 8363
    binary fatty acids, spacings 8364
    cryst. proteins, from dielec. meas. 8713
    opt. active compds., abs. config. det. 9160–1
    chrysene 9162
    pentachlorocyclohexene 9163
    lauric acid 9164
    1, 2-dichloroethane 9165
    salicylic acid 9166
    methyl cyanide-boron trihalides 9167
    trimethylamine-borine 9168
    dimethylamine-boron trifluoride 9169
    compds. showing intramolecular overcrowding 9170
    4 related addition compds. compared 9173
    acetoxime 9174
    trilaurin, *β* form 9175
    branched-chain fatty acids 9176
    glucuronolactone, space group and opt. const. 9177
    dimethylberyllium 9178
    Ni dimethyl glyoxime 9179
    β-lactoglobulin crystals 9180
    synthetic polypeptides and proteins 9837
Crystallization see also *Crystals, growth*
    two-phase alloys, deformation and recrystallization 1367
    growth phenomena in supersat. solutions 2160
    ice, nucleation 2214
    supercooled water, freezing nuclei function 3386
    KNO_3 and $Sr(NO_3)_2$, radiostrontium invest. 3387
    kinetics, ultrasonic waves effect 3906
    low-temp. supercooling effects 4160
    Se 6208
    semi-metals, lattice defects formation 7888
    liquid P, velocity 8337
    Au films, influence of substrate 8339
    long-chain alcohols, bond formation 8722
    anomalous co-crystallization radioact. trace quantities 9126–7
    influence of mag. field 9808
Crystallography see also *Electron diffraction crystallography*; *Neutron diffraction crystallography*; *X-ray crystallography*
    Barker crystal index 3902
    use of polarized i.r. 5909

A complete list of the Subject Headings will be found at the end of the Index.

Crystallography—*contd.*
  mathematical
    space group designation by tables of characters 1483
    criteria of enantiomorphy 3186
    vector presentation of space groups 1495, 3901
    homology space groups 8420
    lattice fundamental parallelepiped emptiness theorem 9122
    choice of triclinic lattice elements 9805
    space group symmetry 9806
    formulation of congruence of 2 lattices 9817
Crystals see also *Liquid crystals*
    theory of crystalline state 7383
  electron states see also *Colour centres*
    diamond, electron and hole mobility 389
    ionic crystals, colour centre theory 730
    alkali halides, trapped hole colour centres 731
    alkali halides, colour centres, luminescence 732
    rocksalt crystals, discoloration 734*
    ionic crystals, polaron states 736
    α-particle-released electron currents, NaCl 1126
    alkali halide *V*-centres 2522
    slow electrons, mean free path 2682
    α–$NiSO_4 . 6H_2O$, magnetic anisotropy 2835
    MnF_2 magnetic anisotropy 2836
    Patterson function limitation of electron density 3206
    temp. and press. effect on term values 4246
    KI with colour centres, new u.v. bands 5272
    energy bands, temp. effect 5626
    Li, correlation energy 5629–30
    inner potential meas. and calc. 5931–2
    rare-earth ions term splitting in crystal field 6122
    rock salt *K* absorption band studies 6134
    non-ideal electron–gas excitations 6210
    beryl, colour 6559
    semiconductors energy gap temp. dependence 6962
    paramag. resonance in Fe alums 7090
    coloured alkali halides paramag. resonance 7091
    MgO additive colouring 7370
    alkali halides with added divalent ions 7381
    phase-limiting relations from electron density max. 7388
    sulphide phosphors, radiationless transitions 7760
    NaCl, energy storage and γ-induced phosphorescence 7775
    temp. effect of energy bands, theory 8083
    alkali halides, effect of electron bombardment 8253
    F-centres, energy levels 8343
    latent image formation processes 8416
    2 states interaction, causing light absorption 9370
    $Fe(OH)_2$ colour change on oxidation 9371
  etching
    Al structures, effect of heat treatment 703
    Ni single crystals 8341
    Mg, cavities and figures 9128
  faces
    metal single crystal, surface structure 746
    adsorption studies 1450
    quartz, rhombohedron surface energy 1513
    surface states theory 4569
    surface free energies 4900
    cleavage, artificial NaCl 5906
    Ag films on rocksalt faces 5930*
    SiC, vicinal 7372
    uni-molec.-steps, microscopic obs. 8344
  growth see also *Crystallization*
    acetaldehyde, rel. to polymerization 725
    microcrystal formation with Po–α–rays 739
    energy thresholds 740
    dislocations from vacancies 741
    nuclei formation in liquid metals 742
    epitaxy of NaCl on Ag 744
    oriented crystals, magnetic matls. 745
    mechanism, interferometric invest. 991
    law, rel. to particle size dist. 1338
    metal crystal orientation on inorganic substrates 1350
    chalcopyrite film on enargite 1487
    $CaCO_3$ metastable phases 1488
    MnF_2 single crystals 1501
    rate det., polarized light method 2158
    annealing twins formation 2159
    in supersat. solutions, microscopical study 2160
    recrystallization nuclear spot invest. 2166

Crystals—*contd.*
  growth—*contd.*
    ice, nucleation rate 2214
    piezoelectric crystals, commercial prep. 2675
    B_4C single crystal preparation 3192
    Fe high-temp. oxidation, nucleation 3193
    electron microscope study 3194
    radially symmetrical, heat conduction control 3905
    ultrasonic waves effect 3906
    Ag on rock salt (110) and (111) 3907, 5930*
    Ge single crystals containing *p–n* junctions 4385
    spiral steps, *n*-paraffins 4790, 6561
    ditto, carborundum, 7374, 9810, 9812–13
    small nuclei surface energy 4892
    metal crystals, shaping 4893
    Sn single crystals, from melt 4894
    microcrystal formation on irradiated crystalline surfaces 4895
    ice crystals and snowflakes 4943
    interference theory, in electrodeposited metal struct. 5810
    metallic electrodeposits 5821
    influence on impurities dist., alkali halides 5900
    thin Au films 5901
    ditto, substrate influence 8339
    quartz, manufacture 5903
    NiFe alloys 5904
    S, monoclinic–rhombic transformation rate 5905
    stressed Al, recryst. 6513
    rel. to equilib. struct. of surfaces 6560
    epitaxial grouping, different crystals 6562
    epitaxy of alkali chlorides on metals 6563
    significance of dislocations 6569, 9129
    large quartz crystals 7375
    deformation twins 7376
    BaO, from vapour 7377
    oriented overgrowth of organic crystals 7378
    theory 7383
    metal physics progress 7439
    $BaTiO_3$ noncubic high temp. phase 8334
    "piezocrescence," theory 8335
    FeO, epitaxial, by high temp. oxidation 8338
    lattice stability and oriented overgrowth 8340
    CsCl thermal transition 8356
    nuclei growth rate in hydrates dehydration 9124
    CdI from aq. soln. 9125
    anomalous co-crystallization of radioact. trace quantities 9126–7
    transition of Sn to superconducting state 9486–7
    Liesegang ring formation, NH_3, HCl 9781
    metal single- and bi-, pre-determined orientation 9804
    quartz in alkali halide solutions 9809
    carborundum, dislocations and polytypism 9811
    graphitizing and non-graphitizing carbons 9814
    epitaxy of Na, K mixed salts 9836
  imperfections see also *Colour centres*
    PbS barrier layer formation 307
    antiferromagnetic compds. 492
    diffusion coeff. temp.-dependence explanation 658
    dislocations, multiplication processes 673
    ionic conductivity theory 735
    prismatic dislocations 737
    prismatic punching 738
    formation from vacancies 741
    rel. to catalytic activity 1419
    KCl, density change with Ca^{++} addition 1473
    plastic flow influence on conductivity and darkenability 1477
    generation of vacancies from spiral dislocation 1480–1
    Li halides, ionic conductivity 1482
    influence of Piobert mechanism on Fe 1486
    stresses and energies of inter-crystal boundaries 2107
    catalyst microdefects and chemisorption 2123
    in oxide catalysts 2124
    $ZnSO_4 . 7H_2O$ 2646
    natural width of grain boundary 3061
    widths of dislocations 3091
    force on dislocations 3092
    adsorption microdefects 3197
    degree of, classification 3904
    Co transformation, dislocation mechanism 3908
    anhydrous HNO_3 3931

Crystals—*contd.*
- **imperfections**—*contd.*
  - Mg, effect on low-temp. resist. min. 4376
  - exciton-enhanced photoelectric emission 4392
  - A.E.C. install. invest. 4770
  - metal crystals, X-ray invest. 4785
  - type II diamonds, laminations 4896
  - equilib. of linear arrays of dislocations 5827
  - impurities dist., alkali halides 5900
  - rotational slip 5902
  - AgBr lattice defects 5908, 5921
  - polycrystalline specimens, new X-ray diffraction method 5913
  - widened lattice interval hypothesis 6486
  - rel. of growth to surface equilib. struct. 6560
  - real crystals, dislocations 6564
  - dislocations as lattice states 6569, 9129
  - carborundum spiral growth, screw dislocations theory 7374, 9810
  - deformation twins growth 7376
  - diss. energies Cd^{++} vacancy complex and NaCl double vacancy 7380
  - vacancies in metals, expt. invest. 7384
  - Cu impurity position, rel. to luminescence 7762
  - semiconductors 7856
  - Si impurities, energy states 7857
  - Ge anomalies 7862
  - alkali halide electron traps 7863
  - oxidic semiconductors theory 7865
  - Ge impurity centres conc., rel. to work function 7883
  - semi-metals, lattice defects formation 7888
  - Sr spatial distrib. in KNO_3 crystal 8336
  - dislocations, elementary theory 8345
  - diffusion anisotropy, metal grain boundaries 9012
  - CdI growth from aq. soln. 9125
  - screw-dislocation/sound-wave interaction 9344
  - clustering in Au–Ni solid solns. 9736
  - slip bands origin in metals 9748
  - carborundum, dislocations and polytypism 9811
- **lattice dynamics** see also *Colour centres*; *Diffusion, solids*; *Paramagnetic resonance absorption*; *Solids, theory*; *Spin-lattice coupling*
  - honeycomb and triangular lattice, statistics 95
  - Debye modes and superconductivity 321
  - isotope effect and latt. props., supercond. 323
  - alkali halides, anharmonicity of oscillations 747
  - order-disorder system entropy 748
  - Raman lines, frequency var. with direction 979
  - Cu single crystals, internal friction var. 1385
  - hindered rotator X-ray scattering 1491
  - quartz, surface energy of rhombohedron planes 1513
  - 1,2-dihalogenoethanes, lattice frequencies 1755
  - antiferromagnetism ordering effect 1921
  - ionic crystals cohesive energy calc. 1959
  - metals, transitional lattice theory 2077
  - compressibility rel. to absorption freq. 2104
  - inter-plane interaction energy 2107
  - orientation-translation waves 2161
  - ionic crystal polarization oscillations 2162
  - space-group C_{2h}^5, lattice symmetry 2565
  - quartz light scattering, Brillouin components 2583
  - anomalous sp. ht. and molec. rotation 2642
  - electron mobility in diamond 2653
  - alkali halides, diel. dispersion 2671
  - slow electrons, mean free path 2682
  - cubic lattice, order propagation 2822
  - *F*-centres, light absorption and non-radiative transitions 3196
  - adsorption, thermal disorder effects 3197
  - ideal paracrystal 3198
  - superlattice formation, effect on modulus 3816
  - order-disorder modifications, binary alloys 3909
  - Patterson functions maxima 3923
  - temp. and press. effect on term values 4246
  - London supercond. theories 4396
  - surface states theory 4569
  - mix-crystals, vibration spectrum 4574, 6857
  - small nuclei surface energy 4892
  - superlattice theory, nearest neighbour assumption 4897
  - order parameters 4898
  - crystal surfaces, free energies 4900
  - anthracene, directional fluorescence 5297
  - temp. shift, electronic energy bands 5626

Crystals—*contd.*
- **lattice dynamics**—*contd.*
  - KCl–KBr mixed crystals, config. free energy 5633–7
  - charge distrib., Fourier synthesis 5916
  - effect on rare earth spectra 6122–3
  - monocrystals coherent light scattering 6152
  - exciton light absorption theory 6221
  - NH_3 and ND_3 lattice frequencies 6382
  - lattice vibrations and optical waves 6565
  - freq. computing, eigenvalue method 6566
  - phase transition, NaCN and KCN 6567
  - dislocations as lattice states 6569, 9129
  - abs. spectra of coloured crystals 6856
  - Ni ions, Ni fluosilicate exchange interaction 7093
  - cooperative phenomena, theory 7144
  - alkali halide lattice oscillations, frequencies and anharmonicities 7379
  - nuclear quadrupole coupling 7382
  - electron diffraction dynamical theory 7393
  - metal physics progress 7439
  - dispersion theory, molec. crystals 7722
  - low-temp. i.r. spectra 7723
  - supercond. theory, electrons/vibrations interaction 7907, 8743
  - ferrites, structure and props. 8031
  - ionic crystals, lattice theory 8342
  - interactions with radiation field 8346
  - benzene, lattice frequencies 8356
  - statistics of simple cubic lattice 8836
  - superlattice formation in b.c.c. alloys 9015
  - diffuse reflections from elastic waves 9131
  - thermal conductivity, Umklapp process 9416
  - electron theory problems 9625
  - hydrated ions vibration frequencies 9810
  - energy bands position det. 9815
- **orientation**
  - rel. to crazing in polymers 653
  - deposits on active substrates 743
  - epitaxy of NaCl on Ag 744
  - oriented magnetic specimens, production 745
  - metal films on inorganic substrates 1350
  - Se crystallites in rectifiers 1834
  - in metals 2077
  - $MgSO_4 . 7H_2O$ nuclei in electric field 2156
  - orientation-translation waves, mol. crystals 2161
  - using Geiger counter spectrometer 2164
  - from zero layer curve photos 2165
  - Al rolled and annealed sheet, single crystals 2166
  - Al elongation invest. 3093
  - oxide nuclei in high-temp. Fe oxidation 3193
  - Zn light figures 4889–90
  - microcrystal formation on Po α-irradiated surfaces 4895
  - in rolled plates of alloys 5814
  - etched Au film anomalies 5822
  - epitaxial grouping, different crystals 6562
  - alkali chlorides on metal surfaces 6563
  - zero temp.-coeff. quartz 7371
  - organic overgrowths 7378
  - "piezocrescence" invest. 8335
  - lattice stability and oriented overgrowth 8340
  - body-centred cubic metals, deformation textures 9030
  - metals, under deformation 9752
  - pre-determined, metal single- and bi-crystal growth 9084
  - low temp. coeff. quartz production 9819
- **twinning**
  - in labradorite 733
  - mechanical, in white Sn 1484
  - plastic deformation theory 2098*
  - Zn, effect on brittle failure 2108
  - annealing twin formation 2159
  - mechanical, in Rochelle salt 3191
  - $BaTiO_3$, low temp. 3903
  - epitaxial Ag on rock salt 3907, 5930*
  - submicroscopic, anhyd. HNO_3 3931
  - Cu, noncoherent twin boundaries 4777
  - common lattice row 5902
  - and yield phenomenon, α–Fe 7321
  - in Bi 7373
  - deformation twin growth 7376
  - "piezocrescence" phenomenon 8335
  - dislocations, elementary theory 8345
  - metals, under deformation 9752

- **Current, electrical** see also *Conduction, electrical*
  - magnet current stabilizer 8837
  - accompanying rotation 9258
  - distrib. in continuously variable medium 9843
- **Curvature measurement**
  - optical flats, by Fizeau fringes 992
  - precision alignment method appl. 2500, 4225
  - stress trajectories, photoelastic models 6046
  - automatic surface-waviness recorder 6767
- **Cyanogen**
  - elimination in spectrographic analysis 7798
  - heat of combustion, formation 7826
- **Cyclotrons** see *Particle accelerators*
- **Damping** see also *Elastic losses*
  - boundary layer, viscous and thermal 1670, 6798
  - torsional oscillation, rel. to temp. 3851
  - damping capacity meas., circuit 5824
  - ferromagnetic wire, torsional oscillations 6505
  - in acoustic resonators 6812
  - oscillating cylind. rods, by surrounding medium 6813
  - surface films effect on water ripples 7594
  - non-vibrating table 8588
  - decay of vibrations on helical spring 8602
  - plastics and rubbers, torsion pendulum meas. 9745
- **Data tables** see *Collections of physical data*; *Tables, mathematical*
- **Decay periods, schemes** see *Radioactivity*
- **Decomposition** see *Dissociation*
- **Deformation** see *Bending*; *Elastic deformation*; *Plastic deformation*
- **Demagnetization**
  - thermo-remanence small disperse magnetite particles 5559
  - Co ammonium sulphate, invest. 5571
  - after-effect rel. to temp. and tension 5591
  - paramag. salt, nuclei special alignment det. 5671
  - ballistic coeff. for prismatic bars 6356
- **Densitometry**
  - sphere and pot-opal, comparison 925
  - sensitometer for image calibration 926
  - new modulated W filament device 1713
  - recording microphotometer 2497
  - direction emulsion-exposure-units recording 4982
  - direct-reading, equiv. 4983
  - new deflection type 5228
  - X-ray microdensitometer 7386
- **Density**
  - **gases**
    - wind-tunnel and jet-engine gases 252
    - He 277
  - **liquids**
    - D_2O, 20°–100°C 7585
  - **solids**
    - Al, variations rel. to structure 1375
    - KCl crystals, bivalent ion effect 1473
    - Na stannate crystals 5924
    - polymers, crystallinity calc. 8238
    - Na metaborate dihydrate 8357
- **Density measurement**
  - bulk, meas. and control in powders 1634
  - in shock waves, X-ray meas. 2450
  - vapour density balance, magnetically comp. 4131
  - accurate vap. density det. 6172
  - limiting, of vapours, general method 6777
  - liquids, magnetic float method 8544
- **Detonation** see also *Explosions*
  - progress review 3118
  - similarity solutions 3119
  - reaction products eq. of state 3120
  - effect of incomplete confinement 3121
  - velocity measurement 3122
  - initiation and growth stages 3123
  - high and low vel. regimes 3124
  - solid explosives, fading 3125
  - pressure measurement 3126
  - physical chemistry 3127
  - streak camera invest. 3128
  - initiation, photographic study 3129–30
  - by spark 4833, 6526
  - in air, source of light 6524
  - fading in cones 6525
  - by shock wave 9049
- **Deuterium**
  - H_2, HD, D_2 mixtures, ideal solution laws test 878
  - specific ionization curve 1141
  - neutron scattering, ang. variation 1322
  - thermal diffusion meas. 1654
  - π-meson absorpt., γ-ray spectrum 2023
  - deuterium compds. prep. 2545
  - H and D collision cross-sections 2758
  - heavy water, mass spectrometer det. 3184
  - thermal consts. 13·1–33·6°K 3485
  - meson effect 3787
  - phosphine mass spectrometric det. 4623
  - use as tracer for water structure and self-diffusion 5160
  - pure, electrolytic production 5682*
  - reaction with methane on Ni catalysts 7344
- **Deuterons** see also *Nuclear reactions, deuterons*
  - photodisintegration 618, 2046, 5775, 9705
  - ditto, low energy 1307, 4723
  - ditto, emulsion study 3022
  - fast, from fast nucleons on nucleus 629
  - magnetic analyser 1115
  - high-energy, production by energetic nucleons 1311
  - static meson potentials 1619
  - T + D reaction, theory 1622
  - ejected by 90 MeV neutrons, ang. and energy dist. 2050
  - neutron disinteg. calc. 2055
  - range-energy, rel. to emulsion composition 3581
  - magnetic moment, measurement 4614, 8131
  - from *p* on Be, ang. distrib. 4708
  - *n–p* interaction theory 5099
  - cyclotron r.f. acceleration system 5476
  - energy loss in heavy ice, review 5483
  - from $p + p \rightarrow \pi^+ + d^*$, range spectrum 6452
  - magnetic moment 7182
  - ground state, pseudoscalar meson theory 7546
  - − ve π-meson absorption 7547
  - exchange collisions with fast nucleons 8968
  - (d, p) and (d, n) reactions, ang. dist. in light nuclei 8971
  - polarization and ang. dist. in $p + p \rightarrow d + \pi^+$ 9691
  - **scattering** see also *Protons, scattering, p − d*
    - scattering lengths 1322
    - *d–p*, at 10 MeV 2759
    - by nuclei, rel. to alpha-particle scattering 2994
    - *s*-wave scattering of nucleons 3001
    - neutron scattering lengths 3796
    - *n–D*, very low energy 4101
    - inelastic, by C^{12} 4713
    - *m–d*, deduction of *m–n* 7291
    - compound, with protons, ang. distrib. 7952
    - 10·4 MeV by H 8188
    - 10·3 MeV, by He^4 8190
- **Development, photographic** see *Photographic process*
- **Diamagnetism** see also *Magnetic properties*
  - perfect, of free electron gas 3532
  - orientation of rod in field 5556
  - silicones, molar susceptibilities 5585
  - free electrons in finite systems 7071
  - Brillouin zones, influence on alloys phys.-chem. props. 8040
- **Diamonds**
  - photo-elasticity 100, 996
  - crystal counter, electron mobility 389, 2653
  - luminescence studies 968–9
  - props. as crystal counter 1125, 8795
  - origin of fluorescence 3456*
  - type II, laminations 4896
  - photoconductivity, charac. 6972
  - counters, space-charge behaviour 7032
  - space-charge-free counter, β-rays 7033
  - semicond., energy gap temp. dependence 8083
  - surface films effect on friction 9038
- **Dichroism** see *Pleochroism*
- **Dielectric properties of substances**
  - rel. to temp. and frequency 290
  - polymers, temp. dependence 298
  - copolymers, dipole moment 299
  - optical meas. method 301
  - $EtNH_2$, Et_2NH, Et_3N, dielectric polarization data 1036
  - relaxation in liquids and solids 1043

Dielectric properties of substances—*contd.*
  medium-loss subst., microwave complex const. 6948
  dispersed magnetized particles 8721
  dipole moment tables 9442
 gases
  NH_3, H_2O, CO_2, CCl_4, CH_6O at 9 400 Mc/s 291
  variation with height in atmosphere 1948
  microwave meas. O_2, Ni, CO_2, He, NH_3, air 2664
  air at 24 000 Mc/s 5616
  dipolar, polarization theory 6193
  dipolar, compressed, orientation polarization 6944
  atmosphere refract. index, r.f., fluctuations 7425
  diel. const. in gas discharge 7912
  H_2, air and CO_2, microwave, new method 8717
  results of beat-frequency meas. method 9442
  argon, up to 2 700 atmos. 9447
 liquids and solutions
  low conductivity liquids, cm-wave region 287
  non-polar fluids 288–9
  supercooled liquids 292
  liquid He 1020
  polystyrenes and polyisobutylenes in toluene 1817
  glycerine 1819
  relaxation period, rel. to dipolar ass. 2430
  dextrose and sucrose aq. solns. 2665
  non-aq. disperse systems 3508
  water, and saturation effect 4366
  blood, 1 kc/s–300 Mc/s 4976
  formamide 5392
  polar chain molecules 5397
  polymer solns., coil size det. 5642
  dipolar, polarization calc. 6193, 7832
  associating liquids, permittivity 6199, 9446
  polystyrene solutions 6200
  dipolar in apolar solvents, orientation polarization 6944
  disperse systems 6951
  water, moisture content meas. appl. 7840
  H_2O in H_2O/dioxan mixtures 8718–19
  in interface layers 9067
  ethylene chloride, from ion pairs diss. const. 9441
  salt solutions, u.h.f. 9444
  relaxation, polar molecules in non-polar liq. 9450
  human blood at microwave freq. 9879
 solids
  electrostriction production of ultrasound 156
  wool, Nylon and Cellophane 285
  wood, anisotropy 286
  Al oxide films 293
  electrets; static charges 296
  anomalous, of Pb and Sr mixed titanates 1038
  cane sugar 1039
  magnetic powders, e.m. wave invest. 1040
  glass, dielectric losses, rel. to composition 1044
  Rochelle salt noise, Barkhausen effect 1822
  lead zirconate, phase transition 2178
  ionic crystals, review 2666
  Cu_2O 2670
  alkali halide crystals, dispersion 2671
  ceramics, h.f. losses 2673
  elec. saturation and pyroelectric effect in KH_2PO_4 2674
  oxide ferromagnetics, freq. var. 2833
  compact state, from powder state 3505
  ultrahertzian absorption and hydroxyl bond 3513
  high diel.-const., loss-angle 3514
  calcite, rel. to temp. luminescence 3515
  alkali and halide ions, revised diel. parameters 3899
  h.p. moulded Rochelle salt 3900
  ketones 4365
  in oxide layer on Al 4368
  glass, const. and loss-angle 4370
  perovskite-type crystals ion polarizabilities invest. 4901
  animal red cells, 1 kc/s–300 Mc/s 4976
  powder, new deduction formula 5387–8
  ionic crystals, rel. to press. 5393, 9448
  Al_2O_3 high temp. breakdown 5446
  metallic-obstacle media 5610
  water of crystallisation 6196
  dispersion in polycryst. matls. 6204
  temp. hysteresis of elec. conductivity 6205
  HCl and DCl, solid state 6946

Dielectric properties of substances—*contd.*
 solids—*contd.*
  soil, at u.h.f. 6950
  ceramics and glass 6952
  semiconductors, at audiofreq. 6964
  heated glass h.v. polarisation 7831
  cubic cryst., effective field strength 7833
  BaO, low-frequency 7837
  ferrites at h.f. 7839
  ceramics and ionic crystals 7842
  cryst. proteins, amino acids and peptides 8713
  adsorbed water layer on inorg. crystals 8714
  Pb zirconate 8716
  ferrites, high freq. 8720
  long-chain alcohols 8722
  polydisperse polar polymers 8723
  magnetite single cryst. 8831
  HCN 9151
  human tissues, 6–17 cm wavelengths 9878
   ferro-electrics
  review of progress 300
  polarization time effects 1816
  diel. const., rel. to loss angle 2667
  relaxation period, rel. to dipolar ass. 2430
  26 ferroelectric invest. 5385
  new ferroelectric tartrates 5391
  permittivity of ferroelectrics 6197–8, 9446
  c.r.o. investigations 6943
  ferroelectricity, review 6947
  domain boundary motion, and h.f. diel. const. 7836
  niobates, tantalates 9152
  theory of ferroelectrics 9438
  alkaline earth titanates, low temp. 295
  $BaTiO_3$, O displacement theory 1042
  $BaTiO_3$, h.f. losses 2673
  $BaTiO_3$, polycryst. 3512
  $BaTiO_3$ temporary hysteresis enhancement 4367
  $BaTiO_3$, X-ray invest. 5389
  $BaTiO_3$, low temp. 5396
  $BaTiO_3$, diel. permittivity 6197
  $BaTiO_3$, polarization invest. 6945
  $BaTiO_3$, electrostatically induced memory appl. 7838
  $BaTiO_3$, hexagonal, Lorentz correction 7841
  $BaTiO_3$ domain struct. and ferroelectric state invest. 8711
  $BaTiO_3$ crystals, new varieties 9807
  $BaTiO_3$ ceramics, vol. change at 3 transitions 6202
  Ba–Pb titanate 5395
  Ba–Sr titanates, effects of press. 5390
  Ba zirconate and stannate solid solutions 9443
  Li ammonium tartrate monohydrate 6203
  KH_2PO_4 group crystals 297
  K niobate 5394
  $KTaO_3$ at low temps. 294, 1818
  Na niobate 5394
  Na vanadate 8715
  Na_xWO_3 9463
  $PbZrO_3$ antiferroelectric structure 9835
  Rochelle salt domain structure 1041
  Rochelle-salt, purification effect 2668
  WO_3, domain structure 2672, 6201
  tungsten oxide, Curie point 6949
Dielectrics see also *Breakdown, electric*
  "metal balls dielectric" 2661
  static polarization representation 4364
  random noise 4410
  surface ionization, Lichtenberg figures 6998
  vapours adsorbed on silica gel 8312
  decaying electrets noise 8724
 measurement
  high polymer fibres and films, microwave 285
  low-conductivity liquids, cm-wave region 287
  equivalence of temp. and frequency 290
  Michelson interferometer at mm wavelengths 1208
  film in waveguide 2662
  gases, microwave 2664
  interpretation of temperature plot 2669
  u.h.f. null method 3506–7
  polymerization non-stationary state invest. 3509–10
  loss-angle on high diel.-const. materials 3514
  double super-het. principle appl. 4369
  phase-shift refractometer for atmos. air 4557
  conducting liquids, apparatus 6195

A complete list of the Subject Headings will be found at the end of the Index.

Dielectrics—*contd.*
measurement—*contd.*
c.r.o. investigations 6943
EtOH, at $\lambda = 3\cdot24$ cm 6953
automatic meas. and computation instrument 6954
moisture content det., indust. appl. 7840
beat-frequency method for gases 9442
polarization, transient method 9449
theory
non-polar fluids 288–9
new theory 302
work in dielectric system small change 1030
solvent effects in dipole moment meas. 1037
alcohol-heptane mixtures, relaxation 1820
thermo-dielectric effect 1821
atom polarization, solvent-effect theory 2663
electrical puncture by suspended metals, theory 2721
ionic lattices, eq. of motion 3503
effective mass slow electrons in dielectric 3504
metal plates dielectric, e.m. wave propag. 3663
fluid, thermodynam. appl. 4357
freq.-selective heating, theory 4371
ferroelectricity, origin invest. 5385
antiferroelectrics 5386
dipolar liq., polarization theory 6193, 7832
free charges, entropy of e.s. systems 6194
dispersion, polycryst. matls. 6204
solid dielectrics breakdown 6249
discharge curves invest. 6941
ferro-electrics, review 6942
orientation polarization dipolar gases and liquids 6944
polarization of dipole liquids 7832
dipolar solids 7834, 8712
dipole coupling in polar liquids 7835
ferroelectrics 9438
mechanical action 9439
solutions, mixtures, calc. of polarization and relaxation 9440
Differential analysers see *Calculating apparatus*
Differential equations
linear systems, generalized response for arbitrary initial conditions 5
2nd-order, zeros evaluation 6
Laplace, accuracy of elec. solution 12
eigenfunction problem, periodic potential 93
integration on digital computing machine 786, 1562
characteristic numbers determination 1563
linear, eigenvalue solution, iteration method 2292
ordinary, linear, 2nd-order, asymptotic solutions 2293
discriminant curve and aperiodic continuity 2294
fundamental functions, deriv. evaluation 2365
non-linear partial, importance in geophysics 3215
non-linear, reversion 3255
soln. by analogous computers 3259, 4035
elliptic, eigenvalues, random walks appl. 3263
Hermite's, new form of soln. 3399
linear varying-parameter systems 4031, 5974
indeterminate, in elasticity problem 4997
"curve" differentials, thermodynam. appl. 5372
vector representation 5972
factorization method for eigenvalue problems 5973
perturbation theory theorems 6673
eigenvalue problems appl., iterative procedures 6674
heat conduction, simple metals 6919
Rayleigh–Ritz method boundary conditions det. 7448
partial, tables for solution 7449
relaxation methods
axially-symmetric flow patterns det. 3398
transonic flow appl. 6075
solution of heat conduction equation 6918, 9413
in 3 dimensions 9225
Diffraction
two-dimensional problems sol. 2581
by small disks and holes 2852
diffraction by an edge 3654
correction of image defects 5321
the ½-plane problem 9399
acoustic waves
shock waves in liquids 151
by paraboloid of revolution 1681
in atmospheric compressional wave propag. 4006

Diffraction—*contd.*
acoustic waves—*contd.*
in acoustic lenses focus 8600
by wedges and corners, theory 9400
field equiv. theorems 9616
electromagnetic waves
on limited paraboloid 518
random screen, appl. to ionospheric studies 767
theory, steepest-descent method appl. 1943
by small holes, Bethe's theory 1947
at open end of circular waveguide 2853–4
at plane screen in waveguide 2855
circular diffraction aerial theory 2860
by an edge 3654
at circular metallic disks 3660
diffraction pattern in circular aperture 4547
microwaves near rods 4549
r.f. optical meas. errors 4550
correction to Fresnel's diffraction theory 5322
by plane wire grating 5601
by paraboloid of revolution 5602
cm waves by metallic and diel. disks 5603
by 2 parallel half-planes 5605
diffracting openings in guides 6364
at aperture in infinite plane 7114
field det. from boundary conditions 7115
round earth in optically inhomog. medium 8858
pulses, by wedges and corners, theory 9400
field equiv. theorems 9616
radiowaves in phase-changing ionosphere 9621
electrons see *Electron diffraction*
light
reciprocal diffraction effect 231
minimum-ray concept 232
rel. to information transmitted 233
by ultrasonic waves 234, 6148
homogeneity defects, shadow study 244
by screen, theory 993
pattern deterioration by roof prisms 1769
black and white hologram 1770
error-free image, light distrib. near focus 1773
at edge of transp. lamina 2582
small-angle, by glass cube 3466
diffraction microscopy, unwanted image elimination 3474
asymptotic treatment 4309
optical images, artificial modification 4310
boundary effect expt. 4311
edge effect in phase contrast 4321
zone plate axial aberrations 5320
correction to Fresnel's treatment 5322
image longitudinal location, precision improvement 5326
anomalous small-angle effects 5328
Fraunhofer's phenomenon, slit width effect 6147
in X-ray imperfect structures analysis 6579
stray light det. for gratings, etc. 6899
homocentric rays 6900
wavefront reconstruction for microscopy 6909
phase contrast, gradual phase var. study 6916
aberrations theory, opt. instr. 7659
longitudinal positioning precision meas. 7783
transmission zone plates 8662
images outside focal plane 9360
Gaussian optics theory 9398
by wedges and corners, e.m. theory 9400
Fresnel patterns, sedimentation const. det. appl. 9782
in the eye 9869
neutrons see *Neutron diffraction*
X-rays see *X-ray diffraction*
Diffraction gratings
systems with plane mirror 235
echelette, new mounting 236
evaporated metal film graticule production 1348
refraction gratings 1771
on cylinders, use 1772
new ruling engine 4135
recording spectrometer, linear wavelength scale 4233
phase-contrast study 5323–4
efficient grating mount 5325
production, plane grating copying 6149
stray light det. 6899

- **Diffusion** see also *Neutrons*
  - unsteady-state 125
  - X-rays, in ∞ homogeneous medium, calc. 7929
  - through an interface, calc. 8562
  - into cube, classical theory 9324
  - by discontinuous movements, analysis 9326
- **Diffusion, light** see also *Reflectivity*; *Scattering, light*
  - diffuse refl. and transmission 208
  - solns. of anisotropic molecules or ions 239
  - photographic objectives, stray light 1005
  - moonstone, schiller 1474
  - gloss meas. of papers 6142
- **Diffusion, gases** see also *Flow, gases*; *Permeability, mechanical*
  - gases and H_2O vapour through wood 122
  - differential equations 123
  - in homogeneous turbulence 124
  - unsteady-state 125
  - ionized gas electrical conductivity calc. 1059
  - bubble stability in liquid-gas solutions 2428
  - Loschmidt method errors 2434
  - A, Ne, N, O, CO_2 and CH_4 self-diffusion temp. dependence 2455
  - droplets and flat surfaces evap. 2610
  - droplet evap., still air 2611
  - classical theory, contributions 3390
  - in atmosphere 3981
  - coeffs. det., interferometric method 5165
  - water vapour in common gases 5166
  - D purification, Pd tube 5682*
  - isotope sep. in atmos. below 55 km? 5683
  - calc. on random flight basis 6077
  - mist/water interfaces boundary conditions 6778–9
  - new separation method 7606
  - imperfect gas radial dist. function 7621
  - coeffs. from sorption data 8244
  - thermal effect 8567
  - N, O and CO_2 self-diffusion coeffs. 8568
  - through porous media 8569
  - porous medium, transient effects 8571
  - through micropores, coeffs. and activation energies 9325
  - **thermal**
    - isotope separation theory 879, 4626
    - de-mixing at h.p. 896
    - N_2–H_2 mixtures, bending balance meas. 1653
    - Ne–H_2, –D_2 and –He mixtures, low temp. 1654
    - thermal transpiration meas. 2435
    - in the critical region 2436
    - effect of pressure 4161
    - gas analysis appl. 4882
    - in hydrogen/water mixtures 5164
    - turbulence effect in diffusion columns 6780
    - in compressed gases 7605
    - cause of errors in gas conc. meas. 8572
    - deposition images of 9327
- **Diffusion, liquids**
  - unsteady-state 125
  - in films, press. and chain length effect 874
  - long-chain molecules in soln. 1437
  - in centrifugal field, eqs. 1649
  - macromolecules in solution 1650
  - chromatography kinetics 2426
  - ion self-diffusion, Onsager theory 3857
  - effect of ultrasonics 4153
  - and wall reactions 4154
  - chromatography kinetics, Jones reductor appl. 4824
  - in chem. reaction and colloid particle growth 4854
  - particle shape and conc. dependence 4855
  - KCl, NaCl, K_2SO_4, sucrose solutions 5159
  - concentration gradient studies 6831–3
  - stratified soln. refract. index interferom. meas. 6832
  - ditto, refract. index optical differentiation 6833
  - liq. currents, in salt dissolution 7601
  - polymer soln., coeff. rel. to conc. 7602
  - coeffs. varying discontinuously with conc. 8561
  - Sarcosine polymers, aq. soln. 9098
  - Ilkovic eq. diffusion term test 9111
  - dependence on mass and volume 9318
  - **measurement**
    - concn. dist., interferometric det. 1651
    - penetrants in cellulose acetate, interferometric invest. 1652

- **Diffusion, liquids**—*contd.*
  - **measurement**—*contd.*
    - Hg autodiffusion isotope exchange det. 2425
    - surface-active solutes, surface tension method 5153
    - water, self-diff., D tracer meas. 5160
    - macromolecules dimensions method 8564–5
    - polymers, diffusion constant 9099
    - interferometric 9397
  - **thermal**
    - binary organic solutions 120
    - entropy of transfer 121
    - liquid mixtures 3385
    - Soret coeffs., membranes 9319
- **Diffusion, solids** see also *Permeability, mechanical*
  - C in α-iron 656
  - $PbCl_2$ in AgCl, differential eqn. soln. 657
  - Na in NaCl and NaBr 658
  - some metals in Cu, Ag, Au 659
  - metals, frequency factor and activation energy 660
  - Se–Tl rectifier forming 1054
  - Sn single crystals, self-diffusion 1339, 9013
  - polycrystalline Sn, self-diffusion 1340
  - Co, self-diffusion 1341
  - metals, self-diffusion, conductance method 1342
  - Cu, meas. without radioactive tracers 1343
  - Zn in melting Al–Zn solution 1351
  - in mobile oxide, catalytic activity effect 1419
  - thermal, in poor conductors, det. 1795
  - *p–n* junctions prep. by impurity diff. 1832
  - Zn in Ag–Zn–X alloys 2079
  - alkali metals self-diffusion mechanism 2080
  - Cu, along Ni grain boundaries 2081
  - interstitial atoms in b.c.c. lattices 2082
  - Na^+ in solid NaCl 3062
  - surface and grain boundary, calc. 3063
  - Cr in iron and steel, spectrographic det. 3064
  - diffusion interfaces, metallographic study 3801
  - A.E.C. solid-state metallurgy 4770
  - thoron through gelatin 4772
  - atomic, in metals, D_0 theory 4773
  - Co self-diffusion, radioactive Co^{60} meas. 4774
  - in cryst. silicates 4775
  - grain boundary, metals 5813
  - Ag self-diffusion, lattice and grain-boundary 5815, 7307
  - P^{32} and S^{35} in NaCl 6490, 8241
  - volume diffusion of metals 6491
  - alkali ions through glass surface layer 6492
  - phase boundary det. 7304
  - in solid S, tracer det. 7305
  - C in metallic carbides, meas. 7306
  - segregation of Po in Pb–Bi alloys 8240
  - coeffs. anelastic meas. in solid soln. 8242
  - vapour sorption, diffusion coeffs. calc. 8244
  - anisotropy in grain boundaries 9012
  - intermetallic, reinterpretation of expts. 9740
  - in multi-layer colour photog. materials 9907
- **Dimensions** see also *Units*
  - decibel analysis 6815
  - elec. and mag. quantities 8492
- **Discharge tubes** see *Electron tubes*; *Ion sources*; *Particle accelerators*; *X-ray tubes*
- **Discharges, electric** see also *Arcs*; *Breakdown*; *Corona*; *Counter tubes, discharge*; *Sparks*
  - leakage in frictional electrification 284
  - internal and external, in dielectrics 296
  - new type, in magnetic fields 335
  - development in long gaps 336
  - flow field near C arc 338
  - molecular cross-section for arcs in air 339
  - frequency influence on Joshi effect 340
  - Joshi effect explanations 341, 5437–9
  - l.p. discharge plasmas 346
  - canal-ray discharge mechanism 348, 2720
  - pos. column, electron conductivity calc. 349
  - Ne ambipolar diffusion 350
  - glow plasma, electron conc. microwave meas. 351
  - plasma oscillations, boundaries effect 352
  - Al cathodes, H–D exchange process 1070
  - high-temp. plasma properties 1072
  - l.p., dynamic characteristics meas. 1073
  - Joshi effect in I vap. under X-rays 1076, 9509
  - floating double probe meas. method 1078

Discharges, electric—*contd.*
  A–Hg, 2 537 radiation and metastable atoms 1079
  flashing discharge in gas mixtures 1080
  Hg rare gas mixtures, $(^3P_2)$ Hg atoms role 1081
  high-current, at low press. 1860
  very l.p., X-rays effect 1861
  temps. det., survey 1862
  diffusion coeff. calc. 1863
  He afterglow, electron removal 1865
  molecular and atomic rare gas ions mobilities 1891
  optical coating evaporator, glow discharge equip. 2083
  cosmical electrodynamics textbook 2309
  statistical phenomena, spectral invest. 2709
  point electrode, electric wind 2711
  v. small inter-electrode distances, initiation 2712
  initiation, reaction and similarity principle considerations 2713
  in long gaps, barrier influence 2714
  h.p. arc columns, temp. meas. 2717
  Joshi effect, h.f. suppression 2718
  radioelectric emission due to gyromagnetic effect 2719
  turbulence without mag. field 3529
  survey, bibliog. 3535
  high-current, toroidal 3536
  gaseous, electronic velocity-dist. function meas. 3540
  in H, decay 3541
  plasma-electron oscillations 3543
  d.c., gas plasma, noise temp. 3545
  glow, org. subst. activation conditions var. 3546
  d.c. glow discharge, oscillations 3547
  l.p., double layer theory 3548
  l.p., electron density det. 3549
  electromag. properties of discharge-filled cavity 3653
  forbidden lines and interionic field, He and H discharges 4243
  glow, as spectrochem. light source 4326
  plasma oscill. in static mag. field 4399
  neg. Joshi effect, rel. to field intensity 4404
  H, afterglows 4406, 8748
  coaxial cylinders, electrodes influence 4407
  discharge-spread region, counter tube 4463
  He and Ne afterglows, recombination 4482, 5252
  glow, NO formation 4589
  air press. effect on electrode erosion 5242
  radial concentration variations 5428
  high-current, role of self-magnetic field 5429
  plasma with neutral gas, dynamics 5430
  glow, electrode reactions 5431
  l.p., gas heating calc. 5434
  d.c. plasma, fluctuations 5435
  l.f. electrodeless, irradiation effect 5436
  over insulators in high vac. 5441
  electron temp., probe meas. 5442
  Ce afterglows, electron-density and light-intensity decay 5443
  pot. distrib., 3-electrode tube with high back voltage 5444
  tunnel effect, insulator films 5447
  electrons from metastable atoms collision 5504
  oxide cathode behaviour, spect. study 5511
  benzene vapour spectra, glow disch. 6110
  Cd lamp terminal voltage 6243
  low-voltage arc type ion source 6272
  Hg vapours de-ionization in strong field 6289
  electron energy distrib. in self-magnetic field 6983
  electrons energy dist. in He 6984
  channel development theory 6985
  oscillographic invest. 6986
  impulse, in inert gases, channel dilatation 6988
  theory of losses 6990
  microsecond transient currents 6991
  pulsed, gas, luminous fronts 6992
  electron temp. rel. to noise temp., l.p. Hg/A discharges 6993
  recombination spectra production 6994
  electron removal in Hg afterglows 6995
  electron removal, A afterglows 6996
  Paschen's law failure and spark mech., h.p. 6997
  Lichtenberg figures 6998
  magneto-ionic waves 7125
  h.p. Hg, radiation re-absorption 7683

Discharges, electric—*contd.*
  glow disch. spectrum in naphthalene vapour 7686
  heated glass h.v. polarization, time relation 7831
  oxide films resist. det. by plasma method 7852
  dielectric const. and electron density 7912
  electron density following, meas. 7913
  Hg–A, l.p., gas temps. and elastic losses 7922
  potl. field, influence on disch. mech. 7923
  external light curr. redn., pos. column role 7924
  glow, in moist air, plasma radiation 7925
  oscillations in electron streams 8053
  plasma oscillations, review 8054
  effect on metal surface, X-ray invest. 8249
  electron temp. det. by noise meas. 8751
  transient currents with metastables 8752
  cathode electron emission 8753
  disch. constants from probe data, nomograms 8754
  plasma, fast electrons invest. 8755
  alkali and alk. earth halides vap., neg. ions 8806
  rectifying action, effect of electrodes p.e. emission 9503
  hot cathode lamps, fluctuations 9506
  pressure drop in mag. field 9510
  plasma oscillations invest. 9610
 high-frequency
  l.p. electrodeless, devel. 347
  microwave gas discharges 1074
  double probe meas. 1864
  toroidal ring, oscillations 3539
  slow waves in gasfilled metal tubes 3544
  electronic torch 6239
  electrode-less between 2 probes, meas. 6245
  maintenance, similarity relationships 7921
Disperse systems see *Aerosols*; *Colloids*; *Emulsions*; *Foams*; *Powders*; *Sols*
Dispersion, optical see also *Refractive index*
  rotary, metallic oxymethylenecamphor complexes 1781
  suspensions, rel. to particle size and wavelength 2584
  air, 2 500Å–6 500Å 5239
  interferometer phase change, corr. 6143
  strongly dispersing media, brightness dist. 6150
  brightness dist. in sea 6151
  CS_2, i.r. anomalous 6830
Dissociation see also *Heat of dissociation*; *Ionization*; *Molecules, dissociation*
  ionic, invest. by combined furnace and mass spectrometer 1111
  CH_4, CH_3OH and $CH_2(OCH_3)_2$ critical potentials 1139
  thermal, nitromethane 1394
  Na-liq. NH_3 soln. studies 4156
  chloroform mass spectra probabilities, isotope effect 4486
  S vapour 5855
  heterolytic, influence of conjugation 6523
  pyridine homologues 8327
  acetic anhydride decomp., kinetics 9051
 electrolytic see also *Ions, electrolytic*; *pH*
  influence of mixing 3135
  amine ions 3855
  succinic acid 5860
  mixture of 2 weak acids, e.m.f. meas. 8292
Distillation see also *Isotope separation*
  Schreinemakers's theorem 689
  open-tube column theory 2609
  theory of countercurrent processes 9102
Doppler effect
  lunar echoes 801
 light
  solar spectrum, tubulence broadening 2336
Double refraction see also *Electromagnetic wave propagation*; *Optical rotation*; *Photoelasticity*; *Polarized light*
  glass, rel. to internal stress 269
  structural, in amorphous solids 995
  electrical colour filter 1779
  liq. crystals 6155
  birefringent objects, phase-contrast microscopy 6160
  $BaTiO_3$ crystals 8711
 electric
  KH_2PO_4 group crystals 297

- **Double refraction**—*contd.*
  - **flow**
    - meas. apparatus, turbulence onset 112
    - polystyrene in soln. 1439
    - effect of a Gaussian distrib. 7787
    - variation with vel. gradient, calc. 8664
  - **magnetic** see *Magneto-optical effects*
- **Drops**
  - surface tension and energy 113
  - uniform, production 875
  - sliding, surface roughness effect 876
  - rain, charge and mass 1068, 3997
  - rain formation by coalescence 1543
  - electrical precipitation from clouds 1544
  - aerosol droplets, formation and meas. 2139
  - behaviour in cloud traversed by sound wave 2215
  - evaporation, diffusion theory 2610
  - evap. in still air 2611
  - stability on solid surface 3381
  - rain, wind tunnel invest. 3382
  - evap. rate, hydrocarbons and fluorocarbons 3486
  - Hg dropping electrode, non-elect. props. 3887
  - large, in warm clouds 3984
  - rain, mechanism of formation 3985
  - coalescence, in clouds 3986, 9214
  - water, microwave reflection 4546
  - cloud droplets, microphysics 4938
  - electrical coalescence, fog and clouds 4941
  - freezing in air and other media 4942
  - small, surface tension rel. to size 5155
  - atomic nucleus-model expts. 5653
  - water, electric suscep. from ionic polarization 6192
  - mist-water interface boundary conditions 6778–9
  - size, formation in clouds, review 7417
  - sound absorption in mists, mechanism 7639
  - chloroform, benzene, aniline, CS_2, scattering factors 7785
  - size distrib. in clouds, balloon-borne meter 8374
  - size distrib. in sprays, new equation 8551
  - shatter in air streams 8556
  - small, vapour press. 8586
  - evaporation in flowing medium 8683
  - condensation in very rapid expansions 8690
  - transfer from air stream to duct walls 9076
  - electronic drop-size analyser 9077
  - raindrop spectrograph 9201
  - size in layer-type cloud 9212
  - in clouds, size distrib. formula 9213
  - water, Airy's eq. for emerging wavefront 9219
  - water vapour spontaneous condensation 9422
- **Dusts** see *Aerosols*; *Powders*
- **Dynamics** see also *Ballistics*; *Coriolis forces*; *Elastodynamics*; *Kinematics*; *Rotating bodies*; *Vibrations*
  - body moving through sound waves 1683
  - equations of motion in general relativity 2361
  - Hamiltonian, of non-holonomic systems 3348
  - motion relative to rotating earth 4123
  - complex systems, mathematical machines synthesis 6048
  - Fleuriais gyroscope, motion study 7573
  - 2-body problem, Einstein's grav. theory 7574
  - Atwood's machine, teaching appl. 8538
  - moment of inertia, student's expt. 9291
  - **flexible bodies**
    - elastic cables, vibration and impact 3349
    - bar vibrating under longitudinal impact 9340
  - **rigid bodies**
    - modified Eötvös balance expt. 7572
- **Dynamometers** see also *Force measurement*
  - optical, diamonds appl. 100
  - soil force det. 100
  - calibration instrument 1635
  - variable-sensitivity 2407
- **Dysprosium**
  - metallic, ferromag. props. 6336
- **Ear** see also *Hearing*
  - auditory system neurophysiology 2240
  - hydrodynamics of cochlea 2256
  - mechanical system damping constant meas. 2260
  - cochlea, acoustical action theory 2261
  - electroanatomy of cochlea 4971
  - vibrating electrode microphonics in cochlear partition 4972
- **Ear**—*contd.*
  - network repres. basilar membrane 5952
  - adaptation, rel. to loudness recruitment 5956
  - auditory nerve, dissonance origin 6663
  - human, informational capacity 7432
  - nature of nonlinearity 8394
  - freq. selectivity det. 8395
  - electric excitation of cochlea 8396
  - potentials and noise of chemical origin 9874
  - electrical response in cats 9875
- **Earth** see also *Geodesy*; *Geophysics*
  - density dist., rel. to luni-solar gravity 1520
  - isostatic structure of crust 1521
  - and planets, origin 1578
  - solar influence on geophysical events 2191
  - moon origin theory 2321
  - natural radiocarbon dist. 2935
  - earth tide 3228
  - gaseous tail hypothesis 3233
  - *S* waves travel-times in inner core 3952
  - hydrodynamics of structure 4067
  - direct contraction theory 4913
  - solar radiation atmos. press. effect 5991
  - gravity field and figure theories 6011
  - evolution of atmosphere 6622
  - instability of internally heated sphere 9839
  - **age**
    - from atmospheric A^{40} content 1532, 5936
    - dating by radioactive C 2193–4, 5685, 6619
    - from K^{40} and Ca^{40} rel. abundance 3226
    - radioactivity of K 3960–1
    - from I^{129} radioactivity 5696
    - isotopic method, modification 7400
    - U^{235}/U^{238} method, source of error 9188
    - K radioactivity and related problems 9190
    - crystal structure of uraninites 9834
  - **composition**
    - inner core hypothesis 2323
    - radioactive constituents and heat flow 3219
    - K^{40}, initial abundance 3960
    - iron core theory, corroboration 4810
    - liquid core, dynam. effects 5933
    - crystal layers, change with depth 9841
  - **heat**
    - radioactive origin, surface temp.-grad. effect 2192
    - flow problems, disc. 3219
    - prod. by K radioactivity 3960, 9190
    - radioactive origin 9182, 9189
  - **rotation**
    - time and frequency det., review 61, 4069
    - rel. to lunar echoes Doppler shift 801
    - pole movt. rel. to geophysical phenomena 820
    - seasonal variation 1591, 8483
    - pole movement (1900–49) 2353
    - effect of sun's magnetism 3302
    - effect of internal heat flow 3219
    - diurnal variation 4068, 6009
    - selection-effects, attributable to fluctuations 5054
    - liquid core dynam. effects 5933
    - instantaneous inertial pole displacement 6007
    - displacement of axis 6008
    - phase of periodic time error 6010
    - 3 unequal principal moments of inertia, theory 7496
    - pole movement (1939–49) 7497
    - motion of axis rel. to earth and to space 8481
    - motion about centre of gravity 8482
    - fluctuations, rel. to mag. field var. 9184
- **Earthquakes** see *Seismology*
- **Echo** see also *Architectural acoustics*; *Reverberation*; *Sound ranging*
  - intelligibility dependence on rel. to direct sound 916
  - echo-free rooms design 1686
  - multiple-echo effect from stored wave train 5177
- **Eclipses**
  - *F*-region recombination during 2205
  - partial, of moon, O_3 dist. effect 4918
  - moon, heat budget 5015
  - lunar, aid to atmos. optical sounding 6648
  - sun, contact time det. 6702
- **Eddy-currents**
  - ferromag. domain boundary propag. vel. 2824
  - heating of hollow metal sphere 3649

A complete list of the Subject Headings will be found at the end of the Index.

Elastic constants see also *Stress/strain relations*
  optical glasses 669
  Mg and Zn sulphate heptahydrates 671
  glass (erratum) 685, 3103*
  Ni rigidity modulus, magnetic field effect 911
  vulcanized rubbers, Gough–Joule coeffs. rel. to moduli 1361
  cubic nitrates, by wedge method 1478
  natural corundum, by wedge method 1479
  elasto-anisotropic bodies 2102
  rubber, high strain 2088
  variation, in torsion 2089
  wood 2090
  paper, Young's modulus 2091
  ionic crystals, compressibility/absorption freq. rel. 2104
  $(NH_4)_3AsO_4$ compliances 2157
  ionic crystal, resonance freq. calc. 2162
  quartz lamina, rel. to thickness 3087
  Al, calc. 3088
  Rochelle salt, KH_2PO_4, $NaClO_3$, RbH_2PO_4 3089
  orthorhombic S 3090
  visco-elastic theory 3094–5
  gels, ultrasonic method 3151
  cellulose, rel. to structure 3800
  Young's modulus var. due to superlattice formation 3816
  beta-brass elastic parameters 3817
  elastomers, dynamic shear props. 3819
  zincblende from X-ray scatt. 3820
  rel. to temp. and viscosity, solids 3851
  optical cryst. matls. 4229
  gelatinous substances, ultrasonics det. 4793
  graphite, high-temp 5833
  rubbers, transitions 6507
  polythene dynamic elast. var. with strain 7315
  high polymers, viscoelastic props. 7316
  zero temp.-coeff. quartz crystals 7371
  body-centred cubic metals 8084
  ellipsoidal inclusion in solid, elast. energy 8256
  galena, new values 8259
  beta-brass, composition dependences 8260
  2-dimensional ionic lattice 8340
  Young's mod., ferrite, var. with density 9025
  modulus dispersion with periodic deformation 9028
  KBr, KCl, $NaClO_3$, galena, hexamethylenetetramine 9132
 measurement
  new ultrasonic method 668
  in single crystals, AgCl 670
  Mg and Zn sulphate heptahydrates 671
  oscillatory method, appl. to concrete 672
  solids, pulse method 1362
  cubic single crystals 1363
  optical extensometer 3086
  new deflection method 3818
  complex, of visco-elastics 4800
  from vibrations of square plates 5174
  soft plastics 6508
  Young's modulus for ferrites 7314
  pulp and paper, audiofreq. sound method 7317
  viscoelasticity, forced reed vibration method 7318
  Poisson's ratio, from electrical meas. 7319
  NaCl, acoustic methods 8258
  Young's modulus for Ni–Cu alloys, interferometric 8261
  gels, ultrasonic method 8262–3, 9080
  soft polymers, constant stress meas. 9026
  dynamic mech. props. plastics and rubbers 9745
  crystals, from diffuse X-ray reflection 9131–2
Elastic deformation see also *Bending*; *Stress/strain relations*; *Torsion*
  Bourdon tubes 1365
  corrugated diaphragms, rigidity 1630
  finite elastic straining 2092
  crystal plates, flexural vibrations 3406
  isotropic, deformation vector integral eq. 3813
  wires under their own weight 3821
  volume changes on stretching rubber 3822
  rubber, application of theory 5825
  hole in sheet, strain distrib. 5826
  rubber, finite strain theory 6509
Elastic deformation—*contd.*
  twisted prism, distortion axis 8270
  effect on electric resistivity, 7 metals 9496
  cylinders, finite extension and torsion 9747
Elastic fatigue
  round bar endurace limit 687
  microcrack formation 3104
  internal stress and friction 4804–5
  in metals, new observations 5834
  steel fracture 5836
  steel 8271, 9032
Elastic limit see also *Slip*
  round, longitudinally grooved bar 687
  compressed disk, critical load 2093
  elasto-anisotropic bodies, characteristics theory 2102
  dislocation, Riemannian geom. treatment 2103
  X-ray invest. 3100
  mild steel, Lüders bands 6510, 9749
Elastic losses see also *Damping*
  Cu single crystals internal friction variation 1385
  paper, internal friction 2091
  piezoelec. crystal, effect on electrical charact. 2849
  internal friction in solids, meas. 3818
  viscosity and internal friction, solids 3851
  internal friction and fatigue mechanism 4804–5
  ferromag. matls. 5625
  damping capacity meas., circuit 5824
  ferromagnet torsional oscillations damping 6505
  plastics, dynamic meas. 6508
  anelastic effects from precipitation in Al–Zn alloys 7323
  instantaneous meas. using piezoelectric gauge 8257
  NaCl internal friction acoust. meas. 8258
  internal friction, solids, conf. 8279
  cold worked Cu single crystals 9040
Elastic relaxation see also *Creep*
  rubber under biaxial strain 666
  recovery, recryst., Al 6513
  vacancies in metals, invest. 7384
Elastic waves see also *Acoustic waves*; *Seismic waves*
  plane, transmission through plate 901
  in crystal, frequency direction-dependence 979
  in steel rods 4177
  propagation in visco-elastics 4800
  in ground, electromechanical source 5935
  ice-sheet flexural waves, air-coupled 6793
  plastic deform. propag. strain-rate effect 7322
  propagation in one-dimensional structure 8871
  in crystals, X-ray reflections 9131
  double integral evaluation theorem 9339
Elasticity see also *Mechanical strength*; *Stresses, internal*
  equilibrium equations, solns. 101
  metals, crystalline interaction and hardness 664
  new variational method 1359
  finite strain, linear theory 1360
  dislocations theory 1364
  deviations from Hooke's law and stability 1370
  rubber, theory 2087
  dislocations, forces and stress fields 2094
  redundant systems, conservation of energy appl. 2401
  ceramic $BaTiO_3$ electromech. oscillations 2677
  deformation vector integral eq. 3813
  press.-vol./press.-compressibility rel., metals 4573
  anelasticity of ferromagnetics 4794
  non-linear, theory 4798
  elasto-plastic equilib. theory, pract. value 4802
  indet.-differential eq., soln. 4997
  widened lattice interval, cryst. metal 6486
  atomic theory 6503
  hereditary, Volterra's eq., solns. 6504
  crystals, theory 7313
  solid soln. diffusion coeff. meas., anelastic 8242
  defects of accepted theory 8255
  equilib. decomp. into holomorphic function derivs. 9024
  elastic dispersion 9028
  corrections, gravity meas. pendulums 9252
  electric forces, direct calc. 9451–2
  porous media 9743
  axisymmetric problem, stress-function approaches 9744
 liquids see also *Compressibility, liquids*
  benzene tensile strength 4136

A complete list of the Subject Headings will be found at the end of the Index.

- **Elastodynamics**
  - visco-elastic periodic phenom. 4800
  - rubber, visco-elasticity, theory 6506
  - visco-elastic behaviour, phenomenological theory 3094–5
  - viscosity and internal friction, solids 3851
  - high polymers, viscoelastic props. 7316
  - viscoelasticity, forced reed vibration method 7318
  - plastics and rubbers dynamic mech. props. meas. 9745
- **Electric breakdown** see *Breakdown, electric*
- **Electric charge** see also *Space charge*
  - leakage in electrification 284
  - static, on dielectrics 296
  - dielectric particle suspensions, effect on viscosity 865
  - in frictional relaxation oscillations 866
  - electrostatic image force theory, quantum limits 1031
  - electrets, theory 1045
  - fine particles, meas. 1068
  - dust particles on dispersion 2656
  - Volta effect, invest. 2658
  - quartz-fibre electrometer, appl. 3592
  - potential distrib. in living cell membrane 5383
  - 300 kV d.c. transformer 6940
  - powders, striations 7830
  - spray-charging of powders 9436
  - storage in polystyrene capacitors 9437
  - from rime layers 9861
- **Electric fields** see also *Field theory, electromagnetic*
  - strength between curved electrodes 283
  - h.f., effect on photophoresis 920
  - at slots in magnetic medium 1193
  - effect on liquid viscosity 1637
  - mapping methods 1941
  - linear and planar problems for var. conductivity 2654
  - mapping with semi-conducting sheets 2655
  - as catalysts 3131, 9766
  - cylindrical lens 3564
  - lines of force 4361
  - Marton's electronic exploration method 4429
  - distrib. in 3-electrode discharge tube 5444
  - due to oscillating mag. dipole outside semi-infinite conductor 5594
  - fluid mappers 6056
  - strength meas. in water-stabilized arcs 6236
  - in white dwarf stars 7492
  - particle motion in field 7649
  - uniformity, in Kerr cell 7845
  - 2-dimensional problem, 2 conducting planes 8710
- **Electric strength** see *Breakdown, electric*
- **Electrical measurements**
  - e.m.f. and int. resist., galvanic cell 700
  - electronic a.c. differential voltmeter 1196
  - contin. obs. of electrets 2659
  - instantaneous peak voltmeter 4362
  - sensit. electrometers, circuits and valves 4373
  - current integrator 4444
  - mica capacitor standards stability 6191
  - mμA current integrator for cyclotron 7958
  - combined current indicator and integrator 9552
  - audiofreq. bridge self-tracking detector 9612
- **Electrical units** see *Units, electrical*
- **Electricity**
  - +ve and −ve, origin 1815
- **Electrobiology** see also *Biological technique*; *Electrotherapy*
  - electromyography, action potentials analysis 1550
  - biological noise 2238
  - potl. dist. in living cell membrane 5383
  - progress review 6655
  - ionic currents, quantum statistics appl. 6657
  - nerve fibre, stimuli propagation 9865
  - d.c. potentials from ear 9874
  - electrode location in cat's ear 9875
  - human tissues diel. props, 6–17 cm 9878
  - blood diel. behaviour, microwave 9879, 4976
- **Electrochemistry** see also *Chemical analysis*; *Electrolysis*
  - cataphoresis in electrolyte 332
  - electroviscous effect 333
  - galvanic cells, Gibbs–Helmholtz appl. 699
  - galvanic cell e.m.f. and internal resistance 700
  - corrosion currents detection 702
  - Al corrosion, effect of heat treatment 703
- **Electrochemistry**—*contd.*
  - Ag corrosion rate in $FeSO_4$ 704
  - polymerization, H-ion influence 722
  - ionic conductivity in crystals 735
  - metal corrosion, contact potential invest. 1032
  - ionic elevation of fluidity 1425
  - ethanol + H_2O + H_2SO_4, conductivity invest. 2128
  - Clark cell thermodynamics 2647
  - fundamentals revision 3133
  - weak electrolytes, high-field conductivity 3136
  - Cd soln. thermodynam. props. invest. 4356
  - strong electrolytes conductivities rel. to conc. 4838
  - ionic transport, liq. silicates 4839
  - colloidal light scatt., gegenions effect 5331
  - ion polarizabilities in soln. 5861
  - oxidn.-redn. potl. var. in Fe salts precipitation 5866
  - ionic association and ionic charge calc. 6529
  - conc. electrolyte systems conductivity 6530
  - e.m.f. in tarnishing 6532
  - S tarnishing of Cu, e.m.f. 6533
  - potl. problems soln. 7348
  - surface eq. of state, charged films 7599
  - phys. chem. textbook 8280
  - h.f. conduct. in high-viscosity soln. 8293
  - elec. and chem. potentials, rel. 8294
  - reversible galvanic cells e.m.f. temp. coeff. 8299
  - Onsager's conductivity eq. extension 9060
  - diffuse layer, interionic attraction theory 9062
  - electrically charged particle systems, theory 9063
  - electrical double layer on Ag I and Hg 9072
  - Ni potentials in foreign ion solutions 9113
  - H ion extraction from electrolytic soln. 9768
  - colloid particle interaction, double layer theory 9780
  - colloidal particle double layer free energy 9789
  - **electrodes** see also *Electrolysis*
    - Cd and Cu, surface areas; Cd polarization 695
    - polarographic half-wave potentials 696
    - H overvoltage on Hg 697
    - galvanic corrosion studies 701
    - Hg jet, electrocapillaries and capac. meas. 1427
    - Sb electrode behaviour 1428
    - amalgam, exchange current radioisotopes meas. 3141
    - *p*H response of Na_2O–PbO–SiO_2 glasses 3142
    - porous, current dist. 3143
    - H electrode, acoust. radiations effect 3144
    - galvanic couples, electrical relations 3146
    - Cu, amalgamated, temp. coeff. 3860
    - free energy of double layers of plates in electrolytes 3861, 5863
    - dropping Hg, accurate potl. 3862
    - glass, temp. effect on resistance 3863
    - polarized, Ag/Ag-halide system 3865
    - Hg dropping, non-elect. props. 3887
    - H electrode study 4841
    - calomel electrode study 4842
    - hydrogen-calomel cell, standard e.m.f. 4843
    - potential build-up at Cu cathode 5862
    - cerous-ceric oxidation-reduction system, overvoltage 6535
    - conc. var. during electrolysis 6536
    - space charge control of Cu overvoltage 6537
    - Hg dropping, appl. voltage freq. influence 6552
    - oxidation-reduction, overvoltage 8296
    - metallic, prep. by sublimation 8297
    - $Zn \rightarrow Zn^{++} + 2\theta$, entropy var. calc. 8298
    - Fe electrode, potential 9064
    - fast electrode reactions 9066
    - diel. const. in interface layers 9067
    - vibrating dropping Hg 9114
- **Electro-deposition**
  - metallic Se electroplating 694
  - electron microradiography 777, 6672
  - porous Al_2O_3 layers, capacity 1345
  - constant cathodes potential device 1430
  - metal tubes by deposition on fibres 1431
  - metals, structure 3078, 5810
  - thin Ni foils 5816
  - cryst. structure, electron diff. exam. 5821
  - interferometric exam. of film 6146
- **Electrodes** see *Cathodes*; *Electrochemistry*; *Electrolysis*
- **Electrodynamics** see also *Eddy currents*; *Field theory*
  - non-linear, theory 73
  - equations with 3, 4 and 5 fundamental quantities 514

Electrodynamics—*contd.*
  moving bodies, Minkowski's 830
  quantum, renormalization 1605
  cosmical, textbook 2309
  classical, self-energy subtraction 2842
  surface area and boundary conditions, moving bodies 3311
  particle energy loss by collision 3573
  hydrodynamics appl. to electromag. eq. 3647
  classical motion in mag. field 4540
  classical, regularization 5087
  Maxwell's covariant canonical formalism 5592
  reciprocity theory 6026
  Ohm's law in moving bodies 6357
  classical, divergences elimination 6358
  bar-magnet velocity meter 7581
  fast electrons, scatt. by electrons calc. 8773
  air core homopolar disk generator 8849
  non-linear, pressure of radiation 9356
  rationalization problem 9608
Electrokinetic effects see also *Electrophoresis*; *Zeta potential*
  cataphoresis in electrolyte 332
  electroviscous effect, solid suspensions 333
  H overvoltage on Hg 697
  Debye effect, ultrasonic study 2476
  electro-osmotic consolidation of soils 2708
  metal suspensions in liquid dielectrics, theory 2721
  a.c. fields effect on osmosis 4152
  osmosis in h.f. field 6069
  dielectrophoresis 6980
  ionography, migration rate relationships 9105
  ionophoresis, 2-dimen. separation technique 9106
  Debye effect, AsS, KCl solutions 9502
Electrolysis see also *Conductivity, electrolytic*; *Dissociation, electrolytic*; *Electrochemistry*; *Ion velocity*
  structure of solutions 331
  a.c., oscillographic studies 1432
  polymeric acids transference properties 1462
  Faraday det., new method 1814
  aq. half-cells potential meas. 2129
  H$^+$-ion problem in aq. solns. 2130
  coloured photographic image production 2269
  spark, mech. surface effect 3140
  Al solutions in mag. field 3145
  current lines, density and direction meas. 4840
  pure D production from heavy water 5682*
  KCl soln., macroscopic space charge 5864
  conc. var. at electrodes 6536
  electromigration in cation exchange resin 7347
  regulated low voltage supply 8295
  effect on ultrasonic velocity in solution 9316
  space charge calc. 9769–70
  Ag, periodic oscillations 9771
 electrodes
  ThO$_2$ and Th(NO$_3$)$_4$, polarization 334
  depolarization in MnO$_2$ cells 698, 5865, 7332
  Co anodic behaviour 1429
  constant potential device 1430
  electrolytic polishing, rel. to ion hydration 2127
  Ti electrolytic polishing in micrographic study 3075
  air depolarization of cell 3864, 4844
  amalgam, wedge effect 5154
  electrolytic polishing theory 6534
  Ni anodic polishing 9061
  H overvoltage, double layer, etc. 9065
Electromagnetic oscillations
  high polymer fibres and films, dielectric meas. 285
  glow discharge plasma electron conc. meas. 351
  plasma oscillations 352, 3543, 6359, 9610
  ditto, in static magnetic field 4399
  ditto, review 8054
  ditto, theory 9561–2
  ditto, meteor trails 8449
  ditto, in metals 2652, 8851
  search-tone analysis 913
  cavity resonator light vel. det. 1710
  due to gyromagnetic effect in discharge 2719
  non-linear, interferences and fluctuations 2845
  excitation problem 2846
  π-mode, end-space resonator, calc. 2848
  low-loss crystal systems 2849
  cavity resonators, theory 2850, 8056
Electromagnetic oscillations—*contd.*
  in toroidal ring discharge 3536, 3539
  d.c. glow discharge 3547
  cavity filled with discharge 3653
  field calc., homog. medium and insulating dielectric 4542
  R–C oscillator analysis 4543
  "collective description" of electrons 5379
  high balance-stability detector circuit 5598
  in inhomogeneous discrete structures 6079
  electron density meas. 7913
  instability of electron beams 8053
  resonator for m and dm waves 8055
  cavity resonators, perturbation filters 8057
  large wavelength, in strongly ionized medium 8059
  randomly modulated, energy dist. 8069
  enforced, in arbitrary domain, theory 8587
  interacting electron currents, theory 9611
Electromagnetic wave propagation see also *Absorption, diffraction, etc.*
  artific. field eq., μ and ε position dependent 520
  astronomical appl., review 792
  lunar echoes, Doppler shift 801
  stratified media, thin films appl. 1199, 2575
  in moving plasms 1200
  anisotropic conditions 1667, 5176
  radiowave rotatory dispersion 1946, 3650
  microwaves through parallel metallic plates 1950
  Bailey's circularly-polarized waves theory 2334
  "artificial matter" 2661
  plane, inhomogeneous, modes 2851
  2-dielectric coaxial structure 2857
  along stratified and continuously varying plasmas 2862
  mag. rotatory polarization and birefringence 3639
  radiowave Cotton effect 3651
  travelling-wave systems, transmission-line equiv. 3655
  reflection and transmission calc. 3656
  reflection and transmission at metal-plate surface 3658–9
  magneto-ionic theory 3662
  metal plates dielectric, theory 3663
  on dielectric-coated wires 4544
  surface-wave over coated plane conductor 4545
  travelling-wave tube amplification 4552
  travelling-wave tube devices, effect of hydrostat. press. in electron beam 4553
  generalized teleg. eq., new solution 5599
  h.f., along triphase symmetric line 5600
  field dist. at metallic and diel. disks 5603
  stimulation of spiral line, theory 5607
  in slightly heterogeneous layers 5609
  delay media elec. and mag. constants 5610
  diel. const. and refract. index, air 5616
  Wiener–Hopf techniques and mixed boundary value problems 6082
  in stratified media 6141, 9620
  transient, in conducting medium 6360
  co-axial spiral line 6362
  2 methods for energy flow 6366
  radiowave sources, photon emission 7111
  elliptic polarization loci 7113
  definition of "minor obstacle" 7116
  Lecher system complex propag. const. det. 7120
  microwave, theory, differential eq. solutions 7127
  microwave power abs. meas. 7136
  cm wave Faraday effect 7138
  large wavelength radiation in ionized medium 8059
  group, through dissipative isotropic media 8060
  packet, dissipative anisotropic media 8061
  energy dist. in randomly modulated waves 8069
  sun and galaxy radio noise, cosmic-ray protons as source 8447
  dispersive media not giving Fizeau–Fresnel effect 8852
  directive, correl. function analysis 9343
  microwave space pattern display, photographic 9352
  Weyl's integral, extension to arbitrary wave shapes 9613
  vector wave functions 9614
  W.K.B. approx. as geom.-opt. series 1st term 9619
 atmosphere
  airborne radar precipitation observation 1542
  radio scattering in troposphere 1547, 8857

Electromagnetic wave propagation—*contd.*
- **atmosphere**—*contd.*
  - internal reflection in stratified medium 1948
  - Sommerfeld's surface wave 1949
  - radio echoes round earth 2234
  - radar geodetic appl. 2354
  - radio-atmospherics 2863
  - v.l. radio waves study, atmospherics appl. 2864
  - atmospheric wave-guide, theory 2865
  - asymmetry, non-horizontal ionosphere layer hypothesis 2866
  - effective earth's radius 2867
  - l.f. radio echoes, polarimeter 2868
  - ionosphere irregularity effects 2873
  - r.f. noise levels record 3240
  - corrections for geodetic meas. 3307
  - r.f. radiometer sensitivity 3652
  - scattering at earth's surface 3657
  - u.h.f., troposphere influence 3666
  - v.l.f., and atmospherics waveforms 3667
  - atmosphere refr. index studies 4003
  - radio duct formation 4005
  - microwave reflection from rain 4546
  - phase-shift refractometer 4557
  - galactic radio wave fluctuations 4956
  - radio signals scattering attenuation 5611
  - radar echo from lightning 5944
  - statistical action of atmospherics on recorder 5945
  - meteor trail radar echoes 5987
  - meteor radiowave reflection 5988
  - tropospheric reflection, water-drop susceptibility theory 6192
  - transit time and freq., diurnal var. 7410
  - r.f. refract. index fluctuations 7425
  - variations of Cygnus A radiation 7457
  - partial reflection, troposphere 8063
  - u.h.f., abnormal refraction 8064
  - radiowaves, rel. var. 8065
  - radiowaves, terrest. mag. effect 8066
  - back-scatter echoes 8067
  - nomogram, spherical triangles 8425
  - plasma oscillation, meteor trails 8449
  - short radio waves, effective speed 8854
  - long-distance scattering 8855–6
  - diffraction round earth 8858
  - transmitter ground-wave 8859
- **ionosphere**
  - random variations 766
  - horizontal irregularities 767
  - Poynting vector in ionosphere 1203
  - harmonics, origin where diel. const. zero 1204
  - magneto-ionic triple splitting 1205, 7129–30, 9622
  - radio-wave, computation 1206
  - fading, interference theory 1207
  - automatic refl. height recorder 1538, 2207
  - anisotropic conditions 1667, 5176
  - absorption, variability controlling factor 1952
  - Kiruna research (1948–9) 2203
  - radio echoes round earth 2234
  - 12 Mc/s, asymmetry 2866
  - group velocity, magneto-ionic theory 2869
  - long and very-long wave absorption 2870
  - extra-ordinary components damping in E_1-layer 2871
  - applicability of ray treatment 2872
  - irregularities, effects on radio waves 2873
  - ditto, from galaxy discrete sources 3271
  - periodic short-wave fading 3241
  - correl. of cosmic ray intensity and radio fadeouts 3616
  - path in curved layer 3668
  - v. long radiowaves reflection 3669
  - cross-modulation, theory and expt. 3670
  - scale height variation 3978
  - solar flares effects (1949) 3979
  - h.f. reflection from aurora 4004, 7422
  - reflection in inhomog. media, appl. 4555
  - radiowave self-interaction 4558
  - l.f. and v.l.f. over $<$ 1 000 km 4559
  - magneto-ionic theory, oblique transmission 4560
  - D- and F_2-layers, 21 Mc/s echoes 4921
  - sky-waves spreading invest. 4922
  - Lorentz polarization, effect on absorption 5612
  - v.h.f. aurora phenomenon 6367

Electromagnetic wave propagation—*contd.*
- **ionosphere**—*contd.*
  - F_2-layer critical freq., world dist. 6630
  - Z-trace polarization 7131
  - plasma resonance in ionos. irregularities 7132
  - oblique incidence, echoes synchronization 7133
  - radiowaves, earth's magnetic field effect 7134
  - arrival direction meas., phase-comparison method 7135
  - trans-equatorial, enhanced after geomag. storms 7407
  - reflected, arrival direction 8068
  - vertical propagation, theory 8860
  - v.l.f., reflection at surface 8861
  - radiowave diffraction 9621
  - short radiowave, correl. with planetary positions 9863
- **waveguides**
  - surface waves, transmission lines appl. 519
  - high-power resonant window 1201
  - synthetic, demonstration instr. 1202
  - 6 mm wave generation 2847
  - circular, open end, unsymmetric radiation 2853–4
  - diffraction at plane screen 2855
  - expansion of field in terms of normal modes 2856
  - radio-atmospherics 2863
  - atmospheric wave-guide, theory 2865
  - travelling wave tube electron beam interaction 2874
  - strongly inhomog. paths 3661
  - 2-dielectric-layered, rectangular, cut-off freq. 3665
  - variables separation 4541
  - variational calculus appl. 4551
  - helix, math. invest. 4554
  - rectangular, with non-homog. dielectric 5606
  - analysis of symm. junctions 6363
  - diffracting openings study 6364
  - fields prod. by discontinuities 6365
  - helicoidal circuits 7119
  - linear-equations systems 7121
  - helical wires 7122
  - electron gas, magneto-optics 7126, 8853
  - offset junction as reactive element 9615
  - nerve fibre stimuli analogy 9865

Electromagnetic waves see also *Diffraction*, *Reflection*, *etc.*; *Field theory, electromagnetic*; *Light*
- due to plane charge and current dist. 516
- magneto-hydrodynamics, isotropic turbulence 1646, 6774
- magneto-hydrodynamic, in ionized gas 1944
- magneto-hydrodynamic shocks 1945
- Hertzian polarimetry, helical rotator models 1946, 3650
- magneto-hydrodynamic waves, cosmical 2309
- mm, generation methods, review 2847
- diffraction by small disks and holes 2852
- slow, in gas-filled metal tubes 3544
- radiowave Cotton effect 3651
- wire-netting shielding theory 4548
- fast electron beams radiation, appl. 5470
- wavefields representation 5597
- in inhomogeneous wave filters 6079
- 3 cm Faraday effect 6329
- relativistic optics, phase and group vel. 6821
- Huyghens principle, expression 7110
- generation by multistream charge interaction 7112
- electro-magneto-ionic waves, relativistic theory 7125
- magneto-hydrodynamic waves dispersion eq. 8062
- energy density in dispersive medium 8070
- waveform anal., time and freq. uncertainty 8434
- wave-number units 6014, 7500
- **radiators**
  - circular groundplane effect 521
  - axially slitted cylindrical 522
  - aerial impedance, input configuration effect 523
  - diel. rods, radiation patterns 1197
  - collinear aerials, theory 1198
  - circular waveguide, open end 2853–4
  - dipoles near cylinders 2858
  - potential theory of linear arrays 2859
  - circular diffraction, theory 2860
  - polystyrene rod 2861
  - variables separation 4541
  - diffraction errors in r.f. optical meas. 4550
  - line sources, effect of grounded slab 4556
  - infinite reflecting plane simulation 5608

Electromagnetic waves—*contd.*
  radiators—*contd.*
    photon emission, theoret. invest. 7111
    current and charge dist. 7123
    helical, radiation field 7124
    finite artificial earth for aerial 8058
    Kirchhoff's formula and other field equiv. theorems 9616
    V-aerials theory 9617
    spherical, feed position 9618
Electromagnetism see also *Field theory, electromagnetic*; *Geophysical prospecting*
    forces on superconductor 327
    metallic particles in field investign. 510–11
    concentric spheres couple problem 512
    rational and non-rational units 513
    equations with 3, 4 and 5 fundamental quantities 514
    linear varying-parameter network analysis 515
    matter-free e.m. field, gravitational energy 829
    electromagnetic ponderomotive forces 1192
    magnetic medium slots, fields 1193
    forces between 2 conductors 1194
    solid sphere induced currents calc. 1195
    magneto-hydrodynamics, isotropic turbulence 1646, 6774
    pos. and neg. electricity, origin 1815
    mapping of fields 1941
    magneto-hydrostatic fields 1942
    magneto-hydrodynamic waves in ionized gas 1944
    magneto-hydrodynamic shocks 1945
    magneto-hydrodynamic waves, cosmical 2309
    field of helicoidal circuit 3645
    e.m. field orthogonal in space-time 3646, 5593
    equations, modification by hydrodynamical analogy 3647
    induction in semi-infinite conductor 3648, 5595
    induction heating of hollow metal sphere 3649
    forces between sphere and wire 4360
    new electromagnet, 20-kW operation 4519
    relativity theory of induction 4539
    separation of variables 4541
    e.m. field calc., homog. medium and insulating dielectric 4542
    induction, relativity appl. 5089
    field due to oscillating mag. dipole 5594
    periodic or shock states, Hilbert space props. 5596
    fluid mappers 6056
    action as space coordinate 6724
    stability of magneto-hydrostatic fields 7109
    gravitational and e.m. fields, mutual action 7505
    whirl theory of gravitation 7507
    manifolds of electromagnetism 7514
    particle motion in field 7649
    canonical scheme, use of potentials and anti-potentials 8051
    Ehrenhaft magneto-photophoresis 8050
    e.m. field of helix, gen. expression 8052
    magneto-hydrodynamic waves dispersion eq. 8062
    treatment by quaternions 9288
    eddy currents and supercurrents, rotating metal spheres, liq. He temp. 9485
    phase shift demonstration with voltmeters 9609
Electromotive force
    galvanic cell during current flow 700
    in tarnishing reactions 6532
    in S tarnishing of Cu 6533
    theory of voltage stabilizers 7971
    regulated low voltage supply 8295
Electron annihilation
    1- and 2-quantum, in motion 2986
    ang. correl. of annihilation rad. 3743, 3749
    3-photon annihilation, meas. 3748
    positronium formation 5380
    ang. correl. of quanta in various substances 8953
    3-quantum decay of positronium 8904
Electron beams see also *Electron optics*; *Particle accelerators*
    transit-time phenomena 362
    flow stability with +ve ions 363
    trajectory analysis, graphical 366
    immersion objective, crossover properties 368
    space-charge effects 369
    interaction with plasma 377
Electron beams—*contd.*
    ion-neutralized, sheath formation 1110
    ejection from betatron 2727
    congruent space charge flow 2730
    narrow, for diffraction 2745
    sec. emission from Ni–Ba and Re 2754
    interaction, in travelling e.m. wave tube 2874
    from betatrons, meas., review 3555
    trajectories in mag. field 3557
    fine beam X-ray tube 3566, 6252
    noise reduction by space charge and transit time 3567
    GeH_4 decomp. by bombardment 3597
    transmission-line equiv. 3655
    disk for investigation 4428
    polarization, theory and observation 4668
    polarized, effect of electric and magnetic fields 4669
    causing conductivity in dielectrics 5412
    fast, radiation appl. 5470, 9531
    high-current, W-cathode gun 5512
    electron-ion plasma and beam fluctuations 6257
    effect on wave propag. along spiral line 6362
    slightly deviated, trajectories 7006
    rotating, for electron lens invest. 7011
    h.f.-modulated, space-charge effects 7012
    bombardment effect on photovoltaic cells 7021
    radiowave generation 7112
    bombardment carbonization of organic objects 7308
    Yale 10 MeV linear accelerator 7932
    electronic ram 7933
    causes of instability 8053
    effect on ionic crystals 8253
    relativistic correction in diode 8804
    hollow cathode for c.r.t. +ve ion studies 9563
    plasma oscillations invest. 9610
    interacting, oscillations of 9611
  absorption see also *Beta-rays, absorption*
    in thin layers, energy loss 2728
    in nylon and formvar films 2748
    fast, in foils 7015
    penetration and scattering in ZnS films 7777
    monoenergetic positrons and electrons 8775
    high energy, in Al 8776
Electron capture see *Ions, recombination*; *Radioactivity, electron capture*
Electron diffraction
    abs. intensities calc. 2190
    diagram interpretation 2744
    gun for narrow beam 2745
    surface problems appl. 2746
    improved camera 5463
    high-current, W-cathode gun 5512
    Kossel–Möllenstedt streaks, structure 6600–1
    200 kV, by benzene vapour 8771
Electron diffraction crystallography see also *Crystal structure, molecular*
    single-crystal, absorption effect 1096
    standard reference substance 1104
    alloy single crystals study 1518
    Friedel's law exception, theory 1519
    intensities calc., dynam. dispersion considerations 2190
    epitaxial Ag on rock salt 3907, 5930*
    convergent-beam Kossel–Möllenstedt patterns 5929
    inner potential meas. 5931
    lattice const. var. with size, alk. halides, Au 6602
    dynamical theory for finite polyhedral crystal 7393
    secondary elastic scattering 8365
    bent crystal invest. 8366
    from curved linear lattice 8367
Electron diffraction examination of materials see also *Crystal structure, molecular*
    lubricant films 866
    hydrocarbon mono- and multilayers 1344
    tetramethylorthosilicate, hexamethyldisiloxane and hexachlorodisiloxane 2085
    order-disorder transf., $AuCu_3$ 2086
    survey of methods 2744
    fatty acid and soap films orientation, metal surfaces 3071
    aliphatic esters and alcohol films on metals 3072
    insulating surfaces study 3080
    variable temp. specimen holders 3081
    replica techniques 3082

A complete list of the Subject Headings will be found at the end of the Index.

Electron diffraction examination of materials—*contd.*
crystal surfaces, growth invest. 3194
graphite 3806
Zn and Cd evapd. layers 3810
boundary lubricant monolayer films 3846
silicone films, transmission 4590
liquid hydrocarbon purity control 4787
Ag films 5316–17
amorphous Ge 5820
metallic electrodeposits 5821
etched Au films 5822
cementite formation, effect of $CO + H_2$ 5823
Ag epitaxy on rock salt 3907, 5930*
sulphide films on Cu 6495
graphite oxide soot 6497
$Cr_{23}C_6$ 6500
thin films, prep. method 7309
fine structure of spots, rel. to particle shape 7310
Ag–Mg evap. films 8248
electron bombardment of alkali halides 8253
ZnO smoke particles 8254
Ni single crystals, etched surfaces 8341
benzene vapour, 200 kV beam 8771
metallic films on molybdenite 9016
metallic smoke 9021
acetyl halides, molec. struct. 9023
acraldehyde, crotonaldehyde mol. structure 9096
orientation in Al_2O_3 films 9741
Cu–Mg alloys, oxide films 9742
hydrous oxides and hydroxides 9783

Electron emission see also *Fluctuations, electrical*; *Photoelectricity*; *Thermionic emission*
effect on compressed gases spark lag 342
thermal ejection as cause of latent image fading 2283
non-metals, in Geiger point counter 2657
high-current, W-cathode electron gun 5512
extraction from metals by neutral gas molecules 7017
from sun 8452
from metal in electric field 8729
cold, in spark gaps 8749
Townsend discharge cathode 8753
secondary
small signals storage on dielectric surface 400
by metastable H atom beam 554
in h.f. fields, "pendulum multiplication" 1109
from Mo by He, Ne, A and H 1319
Al_2O_3, σ rel. to time 2749
from KCl films 2750
thermal treatment of emitters 2752*
from insulators, meas. 2753
Ni–Ba and Re, 50–8 000 eV 2754
from insulators, pulse method 2755
rel. to atomic shell structure 3707
comparison of theories 6263
thoria-coated cathode 6264
photon recorder 6282
electron multipliers, review 6971
at cathode in Townsend discharge 6991
Cu, Mo, reflection coeffs. 7016
from Ni, Mo, MgO and glass 7018
effect of silicone oil vapour 7019
Venetian-blind photomultiplier transit time 7038
from common phosphors 7774
from liquid metal surfaces 7942
Wooldridge's theory, appl. 8777
magnetron cathodes enhanced emission 9566

Electron microscope examination of materials see also *Crystal structure, molecular*
metallography, graticules as guides 663
hydrocarbon mono- and multilayers 1344
Ag, Au, Sn film formation 1349
wet wood fibre surfaces 1358
catalysts fine structure 1402
crystal surface adsorption phenomena 1450
photographic developers action 1555
aq. sols, particle shapes 2141
condensation nuclei 2213
phosphors, peripheral layers 3452
micro-hardness testing appl. 3805
soils appl. 3807
textile fibres 3808
banded pearlite and Cr magnet steel 3809
evapd. Zn and Cd layers 3810

Electron microscope examination of materials—*contd.*
annual review, bibliog. 3811
calcite, crystal habit 3812
emission patterns BaN_6', BaO, SrO 4488
gel structure 4788
n-paraffin spiral growth-steps 4790, 6561
C and N precipitates in α–Fe 4791
$Ni(OH)_2$ sols 5876
Au films, crystallization 5901
graphite oxide soot 6497
weld metal 6499
$Cr_{23}C_6$ 6500
polished metal surfaces 6501
electrodeposited metals 6664
electron carbonization organic materials 7308
specific surfaces det. 7311
portrait shadow-casting 7312
slip lines in α-brass 7320
electron bombardment of alkali halides 8253
Ni single crystals, etched surfaces 8341
cytological appl., review 8672
metallic smoke 9021
tissue sections prep. 9022
β-lactoglobulin cryst. 9180

Electron microscopes
100 Å resolution, table mounting 370
X-radiation danger 1089
condenser aperture device 2735
quotient meter 2740
objective for v. thin sections 2743
Schlieren optics 3559
annual review 3811
electrostatic, A.E.G.–Zeiss 4439
image formation, scattering 5458
permanent magnet lenses 5459
high-current, W-cathode gun 5512
theory of voltage stabilizers 7971

Electron microscopy see also *Crystal structure, molecular*
metallography, graticule guides 663
exposure time photometer 927
single atoms and molecules visibility 1101
illuminating system study 1102
disturbing field meas. 1172
thermal-expansion microtome advancing 1357
wet biological tissues 1358
v. thin sections 2743
replica techniques 3082
paste and powder preparations 3083
crystal surface replicas 3194
stereoscopic 3565
working techniques (book) 3804
exposure meter 4437
rendering atomic dimensions visible 4438
in Germany, review 4439
spiders'-web specimen grids 4789
gradation in positive picture 5460
emission, grain growth study 5904
stereoscopic technique 6498
use of polystyrene particles and shadow casting 6501
positive replica technique 6502
portrait shadow-casting 7312
replica production by hydrocarbon electronic bombardment 8252
in cytology, review 8672
tissue sections preparation 9022

Electron optics see also *Beta-ray spectrometers*; *Ion beams, focusing*
electrostatic lenses, "kidney effect" 364
immersion objective, crossover properties 368
focusing in certain magnetic fields 1097
electron lens caustic surface 1098
illuminating system and image quality 1102
magnetic lenses, optical constants 1103, 2732, 3558, 5457
electron motion in mag. field 1667
focal point and distance concepts 2731, 7010
beta-ray spectrometer spherical aberration 2733
double-lens β-spectrometer, theory 2736
spheroidal mag. field 2738
direction double focusing, inhomog. fields 2739
electrostatic lenses, aberration calc. 2741
axial astigmatism, det. 2742
Schlieren optics 3559

Electron optics—*contd.*
  spherical aberration, foil correction 3560
  beta-ray spectrograph theory 3563
  cylindrical lens, potential and field 3564
  electrostatic focusing for X-ray tube 3566, 4434
  space-charge exploration in cut-off magnetron 3568
  "refractive index," dynamic deriv. 3569
  disk for electron beam study 4428
  Marton's electronic shadow method 4429
  independent electrostatic lens 4430
  einzellinse, thick centre electrode 4432
  sph. aberration of "hairpin" cathode 4433–4
  analysis of immersion systems 4434
  systems with helical axis 4435
  cylindrical lens, calc. 4436
  ring focusing in thin-lens beta spectrometer 4440
  Newton's image relationship 5454
  short lenses, optical power 5456
  magnetic lens, axial field distrib. 5455
  image formation, scattering 5458
  permanent magnet lenses 5459
  improved diffraction camera 5463
  high-current, W-cathode gun 5512
  X-ray fluorescent image intensification 5960
  h.v. X-ray tube gun 6252
  image deflection by crossed elec. deflection system 6259
  trajectories of slightly deviated beams 7006
  astigmatism, curvature correction 7007
  magnetic lenses, aberrations due to asymmetries 7008
  strong magnetic lenses focusing, calc. 7009
  rotating beam method for lens invest. 7011
  magnetic lenses, spherical aberration zonal correction 7013
  diaphragms disposition, helicoidal β-ray spectrometers 7014
  weak lenses, gen. props., 1st approx. 7935
  demonstration apparatus 7936
  elliptical aperture systems 7938, 9518
  optimum focusing calc. 8767
  axial potential in gridded lenses 8769
  3-electrode electrostatic lens, theory 8770
  magnetic sector prisms 9517
  magnetic system analogous to plano-concave lens 9519
  magnetic lens 3rd-order aberration formulae 9520–1
  spherical aberration, new test method 9522
  ion sources electron drain 9523
  automatic trajectory tracer 9524
  magnetic lens, axial field meas. 9586
Electron pairs
  production by photons, recoil nucleus distrib. 1295
  2-pair production 1296
  production by fast electrons 3740
  ditto, screening effect 1297
  Klein–Nishina radiation formula 1298
  in field of heavy nuclei, calc. 4096
  multiple scattering in emulsions 4685
  detect. of gamma-ray polarization 4686
  positronium formation 5380, 8112, 8904
  internal pair creation, O^{16}, theory 5718
  by spin $\frac{1}{2}$ particles 6738
  nuclear, from O^{16} 7263
  high-energy bremsstrahlung and pair production 8950
  search for pair emission from nuclei 9689
Electron theory see also *Field theory*; *Fundamental particles*
  λ-process electron structure 81
  classical, non-physical solutions 83
  interactions with h.f. fields, quantum effects 836
  coherent light scattering 846
  nuclear relaxation time in metals 1229
  superconducting, wave functions 1846
  positron, bound states and scattering 2378
  Hartree–Fock method simplification 4113
  X-ray coherent scattering, electron shielding 4417
  λ-limit, Dirac's new quantization method 5085
  Flint's, Lagrangian formulation 5378
  "collective description," magnetic interactions 5379
  in covariant canonical formalism, Maxwell's electrodynamics 5592
  extra magnetic moment 6190
Electron theory—*contd.*
  electrodynam., reciprocity theory 6026
  quantum mechanics 6734
  electron-positron theory, alternative formulation 7510
  2nd-quantization, positron theory 7517
  electron-neutron interaction 7534
  electron-positron interactions 7561
  interaction of 2 electrons 8515
  4th-order contrib. to self-energy 8517
  positron inner parity 8520
  positron theory, operators interpretation 8532
  positron, Feynman's theory, resolvent operators appl. 9264
Electron tubes see also *X-ray tubes*
  l.p. gaseous diodes, h.f. impedance 383
  parallel plane diode, theory 399, 2774
  travelling wave, amplification 4552
  ditto, effect of hydrostatic pressure 4553
  double-diode analysis 6286
  heat/elec. energy transformation 6290
  parallel plane diode below space charge limit 7042
  photomultiplier sensitivity, time-dependence 7901
  effect of temperature 7978
  magnetron, cut-off static regime space-charge 7979
  effect of anode potential on saturation emission 7988
  space-charge-limited diode, relativistic correction 8804
Electrons see also *Beta rays*; *Cosmic rays, electrons*; *Fluctuations, electrical*; *Nuclear reactions, electrons*; *Photoelectricity*; *Space charge*
  energy transport in liquids 224
  velocity distrib. in low voltage arcs 344
  ditto, high-pressure arc 6983
  electron conductivity in discharge 349
  energy in gas, microwave meas. 402
  electron microradiography 777, 6672
  in solar chromosphere and prominences, concn. 813
  electron temp. meas. in gas discharges 1078
  Pb cascade showers study 1095
  electrical conduction theory 1826
  freeing in compact metals 1957
  screening of interactions in metal 2652
  slow, mean free path in ionic crystals 2682
  range-momentum meas., gases 2729
  slow, in dielectric, effective mass 3504
  mobilites in strong elec. fields 3520*
  free electron gas perfect diamagnetism 3532
  density det. in l.p. gas discharge 3549
  no. in universe, original calc. 4109
  $-$ve and $+$ve, masses 4359
  capture in 30 MeV betatron 4421
  low-energy, from stopped μ-meson 4749
  positronium 5380, 8112, 8904
  mass relative to proton mass 5382
  shot and Johnson noise theory 5400
  from Ce afterglows, density decay 5443
  slow, interaction with crystal surface 5465
  non-electromag. interaction with neutrons 5471
  CdS bombardment, conduct. variation 6220
  electron/positron mass difference, from annihilation radiation discrepancy 6442
  behaviour in ionic crystals 6957
  mobility in AgCl 6959
  mobility in CdS 6967
  energy distrib. in He 6984
  removal in Hg afterglows 6995
  ditto, A 6996
  reflection coeffs., low energy, Cu, Mo 7016
  cascades, fluctuations and gen. dist. problem 7050
  magnetic moment, atomic beam method 7188
  masses of carriers in conductors 7847
  density in ionized gases, meas. 7913
  gyromagnetic ratio 8145
  anomalous spin gyromag. ratio 8146
  fast, in positive column, energy distrib. 8755
  effect on photo plates 8779
  electron theory of solids, review 8872
  unwanted electron tracks eradication 9223
  effective mass, superconductivity effect 9493
  electron-photon cascade shower theory 9530
  electron theory of crystals 9625

Electrons—*contd.*
- **radiation** see also *Electrodynamics*
  - nucleon-nucleon collision bremsstrahlung 76
  - Cherenkov and complex Doppler effects 376
  - Klein–Nishina formula 1298
  - bremsstrahlung theory 1612, 3325
  - quantum theory, finite time intervals 2364
  - Cherenkov emission, invest. 3573
  - in mag. field, consequences 3574
  - in presence of heavy nuclei 4096
  - Cherenkov counter, fast electrons 4426
  - interaction with e.m. fields, quantum effects 5103
  - 5 MeV betatron bremsstrahlung spatial distrib. 5467
  - Cherenkov, conic distrib., natural spread 5468
  - fast electron beams, applications 5470, 9531
  - bremsstrahlung, energy-angle distrib., 7020
  - 46 MeV bremsstrahlung intensity 7274
  - radiation reaction in Wheeler–Feynman theory 7529
  - Cherenkov, classical and quantum theory 7934
  - retardation, effect of size of nucleus 8121
  - Z-dependence, ang. distrib. 8778
  - from synchrotron beam 9539
- **scattering** see also *Beta-rays, scattering*
  - in thin films 371
  - polarization by Au foil 372
  - high-energy, elastic, on protons 373
  - electrons and positrons by nuclei 374
  - effect of nuclear structure 375
  - neutrinos scattering cross-section limit 649
  - by light nuclei, spin interaction 839
  - by neutral impurities in semi-conductors 1051
  - single, fast electrons at small angles 1105
  - Dirac equation, theory 1106
  - probable energy loss in matter 1107
  - in crystals in large fields 1108
  - fast electrons in emulsions 1868
  - 100 MeV, from heavy nucleus 1869
  - mobility in diamond 2653
  - depolarization and reflection-transmission effect 2747
  - by nylon and formvar films 2748
  - relativistic, by atoms in Coulomb field 3343
  - multiple, of fast electrons in Al 3570
  - elastic, by H atoms, variational method 3572
  - back scattering and absorption, invest. 3735
  - difference from β-rays 4443
  - multiple, electron pairs from (Li, p) gamma rays 4685
  - higher Born approximations 5125
  - in electron-microscope image formation 5458
  - electrons and positrons, relative back-scatt. 5464
  - energy-loss dist. in Al 5466
  - elastic, finite nuclear size effect 5659
  - inelastic by atoms, variational method 6025
  - electron-electron, 0·6–1·7 MeV 6260
  - internal-conversion electrons, anomaly 6761
  - secondary electrons from γ-rays 6262
  - energy loss in foils 7015
  - in ZnS films 7777
  - positrons by electrons, cloud-chamber study 7939
  - back scattering expts. 7940
  - positron scattering at 105 and 185 MeV 7941
  - effect of size of nucleus 8121
  - secondary, elastic, in electron diffraction 8365
  - elastic, influence of nucleon dissoc. 8772
  - fast electrons by electrons, highest approx. calc. 8773
  - effect on ang. correl. meas. 8913
  - elastic, in He, Ne and A 9526
  - gap meas. in emulsions 9527
  - range and straggling, high-energy electrons 9528

Electro-optical effects see also *Double refraction, electric*
- electrophotophoresis, theory 524
- Kerr cell high-speed photog. appl. 776, 4990
- in controlled colour-filters 1779
- Kerr cell, transmission line appl. 4372
- piezo- and electro-optic eq., tensor form 6206
- dipole coupling, polar liquids, theory 7835
- Kerr cell construction 7845

Electrophoresis
- Schlieren pattern analysis 243
- solid spheres in electrolyte 332
- ThO_2 and $Th(NO_3)_4$, electrode polarization 334
- electrophotophoresis, theory 524
- spherical particles in strong fields 1067
- fine particle charge meas. 1068

Electrophoresis—*contd.*
- albumin, temp.-dependence 1856
- organic dispersions 3534
- dielectrophoresis 6980
- superimposed coordinates 7911
- 2-dimensional, separation technique appl. 9106
- proteins, meas. by potentiometry 9499
- proteins, meas. by conductimetry 9500–1

Electrostatics see also *Electric charge; Electric fields*
- electrification, gaseous discharge 284
- static charges on dielectrics 296
- work in dielectric system 1030
- image force theory, quantum limits 1031
- Geiger point counter invest. 2657
- Volta effect invest. 2658
- electrets, contin. observation 2659
- capacitance of cube, calc. 2660
- "stick-slip" friction, electrostatic origin 3844
- forces between sphere and wire 4360
- frictional electrification interpret. 4363
- diel. static polarization representation 4364
- capacitance of condenser with twisted diel. cylinder 5384
- aerosol invest. method 5875
- fluid mappers 6056
- mica capacitance standards, stability 6191
- 300 kV d.c. transformer 6940
- electrographic image formation 7829
- powder patterns with a.c. 7830
- decaying electrets, noise 8724

Electrostriction see also *Piezoelectricity*
- in ceramic $BaTiO_3$ 2677
- polycryst. $BaTiO_3$ 3512
- in Onsager liquids, theory 5399
- $BaTiO_3$ elastic and electromech. coupling coeffs. 6956
- components of ferro-electric solid solutions 9443
- forces, direct calc. 9451–2

Electrotherapy
- electromyography, action potentials anal. 1550
- impulse generator 3245
- human tissues diel. props., 6–17 cm 9878
- human blood diel. behaviour, microwave 9879

Elementary particles see *Fundamental particles*

Elements
- neutron cross-sections 650
- transuranics and Tc, Pm, At, Fr, review 718
- stability 2937
- Bk, discovery and invest. 2949
- Cf, discovery and invest. 2950
- 97 and 98, radioactivities prediction 2951
- 61, radioactivity and distrib. 2952
- α-emitting, linear property 2964
- new α-emitters? 3723
- magic numbers and Tc and Pm 6387
- transition, metallic state, valencies 9092
- m. pts. rel. to b. pts. 9419
- **chemical properties**
  - Bk 2949
  - Cf 2950
- **origin**
  - lighter elements 2304
  - theories, summary 2312
  - natural radioactivity, consequences 9189
  - neutron-capture theory in expanding universe 9682
- **relative abundances**
  - special and magic numbers theory 541
  - H and O in upper atmosphere 1534
  - lighter elements 2304
  - theories, summary 2312
  - K, in interstellar matter 2931
  - K^{40} and Ca^{40}, earth's age det. 3226
  - K^{40} initial abundance 3960
  - nuclei excited states calc. and prestellar conditions 5011

Emissivity
- thoria, factors affecting 923
- thoria, etc., coatings 2491
- total, of titanium 3484
- tungsten, absolute spectral 7656

Emulsions see also *Colloids*
- formation and flow 1441
- stabilization, molecular exchange effects 3150
- elec. parameters 6951

Emulsions—*contd.*
electrolyte potl. problem solns. 7348
drop-size distrib., new equation 8551
rheology and stability 9075
Energy levels see *Atoms, structure*; *Molecules, energy levels*; *Nucleus, energy levels*; *Spectra*
Entropy see also *Thermodynamics*
of transfer of dissolved molecule 121
irreversibility law, deduction 281
of mixing, in solutions 282
galvanic cells, entropy change 699
crystal lattice dynamics 748
Onsager's principle 1025
analogy with ophélimité in economics 1028
of vaporization, and internal order 2650
and information, Maxwell's demon 3500
and information, Fermi statistics appl. 3501
changes in organic reactions 3855
of melting, metals 4336
well-informed heat engine 4358
of activation, metals interstitial diff. 4773
solid compds., est. 5373
communal, dense systems 5374
polyatomic molecules, calc. 5376
as local order function, binary solid solns. 5633–7
transport in chem reaction 5846
excited and ionized gases in equilib. 6189
of e.s. systems in dielectrics containing free charges 6194
molecules, calc. from spectroscopic data 6383
statistical defn., rel. to thermodynamic 7570
information theory appl. 8429
aqueous solutes 8566
increase in ∞ universe 9435
properties of substances
wind-tunnel and jet-engine gases 252
cryst. benzene, from molec. data 5375
benzene-diphenyl system 1388
H, high-temp. 6186
He 277
liquid He^3 1805
liquid He, rel. to viscosity 1806
Hg, set liquid and vapour 5369
K chromic alum, low temp. 1933
$Zn \rightarrow Zn^{++} + 2\theta$ var. calc. 8298
$ZnSO_4 . 7H_2O$ and $6H_2O$ 2646
Epitaxy see *Crystals, faces*; *Crystals, growth*
Equations see also *Differential equations*; *Integral equations*
telegraph, new solution 5599
resolvent operators appl. to Feynman's positron theory 9264
algebraic
high-degree, grapho-analytical soln. 7
initial excitation linear systems 9226
simultaneous
a.e. network calculator soln. 10
dimensional
physical tensor invariants appl. 4028
Equations of state see also *Thermodynamics*
piezo-electric, transducer appl. 142
piezo-electric, deriv. and tab. 143
rocksalt isothermals from thermal expansion 1027
quantum-mechanical 1629
2-component van der Waals fluid 1665
liquid-vapour equilib. 1666
compressed gases and liquids, Lennard–Jones and Devonshire 2648
rigid sphere molec., free vol. 4175
virial theorem in quantum mechanics 5129
alkali metals 8707
corresponding states of polyatomic molecules 8709
gases
Bose–Einstein gas, condensation 99
H, *P-V-T* properties 126
3rd virial coeff., non-polar gases 899
N compressibility and corresponding states 2456
explosion reaction products 3120
water, 2nd virial coefficient 4571
mixtures, corresponding states 5172
van der Waals', adsorption appl. 5880
3rd virial coeffs. of polar gases 6791
polar gases critical const. 6792

Equations of state—*contd.*
gases—*contd.*
CCl_4, SF_6 7608
in intermolec. forces det. 8584
virial coeffs. of methyl fluoride 9338
He, 2 states in gaseous phase? 9426
liquids
free volume 4149
quantum mech. appl. 6188
charged films, surface 7599
Liq He I λ point, nature 8708
Erbium
X-ray absorption edges 3552
Errors
in Laplace equation circuits 12
in calculating board calc. 13
control system integrated input, criterion 17
range-finding, distribution 1633
reduction by curve analysis 8435
astronomical
astrometric, from emulsion errors 19
pivot, of reversible transit 9232
theory see also *Measurement, errors*; *Random processes*
at point on least-squares curve 789
heterogeneous variances, est. 790
of least-squares, polynomial coeffs., est. 2303
statistical, ionization chamber appl. 5494
in radial triangulation 6013
Ethane
substituted, molecular data 7735
Ethyl alcohol see also *Alcohol*
dielectric permittivity 6199
diel. const. and loss, $\lambda = 3 \cdot 24$ cm 6953
electrical strength 8756
Ethyl chloride
adsorbed on silica, dielectric behaviour 8312
Ethylene
planar vibrations of molecule 2892
quadrupole moment 5281
magnetic rotatory power 8073
cool flames 9763
Ethylene diamine tartrate
optical props., X-ray data 3946
elastic and piezoelectric coeffs. 5174
Ethylene oxide
mol. structure, moment 6126
Ethylene sulphide
mol. structure, moment 6126
Europium
amalgam, magnetic susceptibility 1922
Evaporation see also *Vaporization*
through surface film 114
abnormal crystal growth phenomena 740
from snow surface 1541
rel. to boundary layer theory 1659
droplets and flat surfaces, diffusion theory 2610
droplets in still air 2611
in vacuo, drying 5352
pseudo-structure allowing loss of mass 6167
naphthalene molec. mobility 6169
vacuum, of radioactive materials 6922
vegetation, effect in meteorology, etc. 7416
drops, flowing medium 8683
Examination of materials see *Electron diffraction examination*; *Electron microscope examination*; *X-ray examination*
Exchanges, chemical
U ions in soln. 1389
Co and Ta, isotopic 1390
isotopic, N and O in N_2O, partition function ratios 2540
S-exchange, radio-S invest. 3112
CO/CO_2, isotopic, kinetics 3114
annual review, bibliog. 3853
O exchange between liquid SO_2 and $SOCl_2$ 3854
N_2^{30} and N_2^{28} over catalysts 4814
NH_3–D, kinetics, microwave method 4815
water between cations and solvent 5849
isotopic exchange rates rel. to surface texture 5850
divalent ions adsorption on hydrous ferric oxide 5884
radioactive ions in soln. and metal surfaces 9041
isotopic, different valency metal ions 9042

A complete list of the Subject Headings will be found at the end of the Index.

Exchanges, chemical—*contd.*
isotopic, kinetics 9043
NH_3/D_2 on Fe catalyst 9047
det. of adsorbed H_2O by D_2O exchange 9759
Excitation see *Atoms, excitation*; *Molecules, excitation*; *Nuclear excitation*; *Vibrations, excitation*
Explosions see also *Detonation*; *Shock waves*
sensitized by chloropicrin 690–1, 2117
initiation in liquids 1393
flame gases, thermal radn. and chemiluminescence 1760
H/O, in boric acid-coated vessels 2118
gaseous mixtures burning mech. 2616
gaseous, resistance thermom. study 2638
gaseous butanone/oxygen system 3496
photographic recording 4024
N_3H, decomp. mech. 4828
thermal H–O reaction at rel. low temps. 4827
X-ray shock-wave photographs 5183
air-rectifying app. 5361
shaped charges, lined cavity, nuclear transmutation 5735
metals scabbing 5812
propane-air mixt. inflammability ranges 7336
wave outside linear charge, photog. recording 7337
H–O reaction at 2nd explosion limit 7338
"knock" reactions 8282
petrol-engine knock invest. 8283
initiation and propag. in azides and fulminates 8285
azides, decomp. and explosion invest. 8286
N_3Cl and NCl_3 decomp., chemiluminescence 8655
air-rectifying apparatus 8694
Extra-terrestrial radiation see *Cosmic radiations, r.f.*; *Sun, radiation*
Eye see also *Vision*
retinal receptors, correlation data 2241
props., rel. to polarized light 2242
macular pigment not present? 2243
receiving organs spectral sensitivity 2248
spectral sensitivity for given brightness 2249
rods and cones sensitivity in parafovea 2250
crystalline lens, mydriatics reactions 2255*
peripheral contrast thresholds 3242
heavy pigmentation and tritanopia 3243
crystalline lens, selective absorption 4010
dark adaptation, pre-exposure studies 4962
dark adaptation level, rel. to testflash time 4963
accommodation microfluctuations 4966
microfluctuations, influence on retinal image 4967
human, informational capac. 5947
retina events model, colour vision 5948
factors affecting adaptation 5949
retinal colour responses to micro-stimulation 6658
dark adaptation, nervous component 6659
dark adaptation time after stimulus 6660
rod-processes study, polarization method 7427
critical flicker freq. rel. to age 7428
white sensation, neutral adaptation 7789–90
retina voltage meas. amplifier 8387
visual acuity and normal tremor 8392
human, resolving power 8393
retinal excitement by X-rays 9866
internal diffraction 9869
photometric props. var. 9870
resolving power from energy viewpoint 9872
***F*-centres** see *Colour centres*
Faraday effect see *Magneto-optical effects*
Fatigue see *Elastic fatigue*
Ferro-electrics see *Dielectric properties*; *Piezoelectricity*
Ferromagnetism see also *Magnetic properties*; *Magnetism*; *Magnetization*
antiferromag. materials, resonance 490, 3640, 5564, 5566
resonance in Mn–As 491
antiferromag. compounds, deformations 492
low temp., sigma phase in steel 493
ferromagnetic domains, review 501
magnetization, Rayleigh law exceptions 502
Fe coercive force, inclusions effect 505
magnetization curves 506
h.f. permeability 508, 2826
at very high frequencies, dispersion 1178
hysteresis, discussion 1187

Ferromagnetism—*contd.*
isolated and connected grains, coercive field 1189
Barkhausen jumps in magnetic after-effect 1190
Curie constant calc. 1919
antiferromagnetism ordering effect 1921
resonance in Ni ferrite 1929
temperature magnetic hysteresis 1934
Cu–Zn ferrite cation dist. 1937
reversible susceptibility 1938, 4522
Hall effect 1955
Cr_7S_3 sp. ht. invest. 2641
alloys, progressive intermittent activation 2820
domain boundary propag. vel. 2824
magnetic conversion spectra 2828
single domain structure 2830
Mo-permalloy at 3 000 Mc/s 2832
domain sizes from neutron depolarization 3054
$NiOFe_2O_3$ microwave resonance absorption 3628
magnetic after-effect, freq. var. 3632
counter inversion phenomenon 3642
magnetic viscosity rules 3643–4
conditions for occurrence in metal compounds and solutions 4518
resonance in ferrites 4521
gyromag. const. meas. 4524
thin films 4528
antiferromag. compds., cryst. struct. changes 4529, 5569
non-reversible sudden changes invest. 4537
transition metals, *d* shells interactions 4616
Fe_3O_4 antiferromagnetism; neutron scattering proof 4764
anelasticity in Ni 4794
ground state in antiferromag. 5554
domains in Ni bicrystals 5560
Hall effect in ferromagnetics 5622
Fe–Al–Si alloys superlattice studies 5567
Foucault-current study 5570
Fe–Si crystals domain struct. 5588
single-crystal domain wall movt. 5589
mag. after-effect rel. to temp. and tension 5591
Mn compds. Curie temp. rel. to conductivity 5670
neutron scattering by crystals 5806
neutron diffraction of anti-ferromag. subst. 5910, 7072
antiferromag./paramag. transitions 6312
ultrasonics propagation, magnetized steel rod 6081
Zn, Ni and Co ferrites, true sp. ht. 6182
resonance, review 6315
intermittent activation origin 6316
magnetic domain patterns 6322
domains in Co crystal 6323
specimen with large domain 6324
irreversible viscosity in weak fields 6325
anomaly in ferrites thermal expansion 6328
antiferromag., experimental evidence 6331
NiO and CoO antiferromagnetism 6332
α Fe_2O_3 mag. props. 6333
non-metallic ferromag. compds., props. 6334
Mn compds. with perovskite structure 6335
metallic dysprosium 6336
MnAs and MnBi transformation points, rel. to antiferromag. 6337
ferrites, mag. props. invest. 6339
of FeB_2 alloy 6343
in Mn–In system 6345
antiferromagnetism in single crystal 6346
antiferromag. at low temp. 6348–9
ferrites crystallography 6351
metals, elec. resist. in mag. field, low temp. 6368
Hall–Kikoin effect, dynamo steel, strong fields 6369
and cohesive energy, transition metals 7069
domain-width det. in Fe–Si single crystal 7078
resonance absorption, Ni films 7080
in weak fields, and Curie point, review 7081
Lecher system propag. const. det. in resonance study 7120
antiferromagnetism and Cr_2O_3 struct. 8025
Ni ferrite microwave resonance absorpt. *g*-factor det. 8026
magnetite single crystal microwave reson. absorpt. 8027
and antiferromagnetism, conf. rep. 8029

Ferromagnetism—*contd.*
  - domain boundary displacement due to tension 8047
  - antiferromag. crystal, critical field curve 8835
  - resonance absorpt., low-temp., in $MnOFe_2O_3$ 8841
  - saturation magnetization var. with compression 8868
  - magnetite, transition and antiferromagnetism 9596
  - neutron diffraction from exchange-coupled lattices, high temp. 9733
- **theory**
  - antiferromagnetism in triangular lattice 95
  - antiferromagnetism, Weiss molecular field theory 481
  - superlattice alloys, theory 482
  - ferromagnetic block 499
  - domain theory 500
  - cubic lattice, order propagation 2822
  - Weiss theory validity limits 2823
  - anisotropic permanent mag. alloys 2831
  - inertia and damping const. of domain boundaries 2834
  - Van Vleck antiferromagnetism theory 2836
  - Heller and Kramers, spin-wave theory 3622
  - Ni, superficial photoelectric effect 3629
  - Goldhammer effect, mech. 3673
  - domain boundary energy det. 4517
  - spin waves theory 4525
  - 3-dimensional ferromag., statistics 5550–1
  - antiferromagnetism, progress review 5552
  - antiferromagnetism, itinerant electron model 5553
  - electron ferromag., rectangular bands 5555
  - Hartree–Fock eq. and antiferromagnetics 5561
  - internal friction effects 5625
  - antiferromag. theory, recent developments 6313
  - magnetic viscosity 6314
  - dynamics of Bloch wall, h.f. permeability 6317
  - galvanomagnetic effects 6320
  - coercive force theory 6321, 8045
  - ferrites, spontaneous magnetization 6340
  - antiferromag. resonance theory 6347
  - Co Tutton salt antiferromag. transition curve 6350
  - antiferromag. and order-disorder transitions 6760
  - resonance absorption, historical survey 6851
  - collective electron ferromagnetism 7063
  - influence of order 7064
  - electronic state, intermittent activation 7065
  - coercivity theory 7066
  - resonance absorption, theoretical invest. 7079
  - cooperative phenomena, theory 7144
  - calc. of Weiss factors, Fe, Co, Ni 7195
  - Curie point dependence on mag. field 8019
  - inertia of oscillating domain wall 8020
  - resonance absorption in magnetite single crystals 8028
  - Ni ferrite formation, reaction kinetics 8032
  - ferrites magnetization temp. dependence 8834
  - statistics of cubic lattice 8836
  - Feynman's theory of positron, resolvent operators appl. 9264
  - non-local *S*-matrix theory 9265
  - *K*-capture calc. 9283
  - antiferromag. ground state energy limits 9587
  - antiferromag. substances, dipolar broadening 9588
  - Ising problem analytical approach 9589
  - free electron theory 9590
  - FeS_x, origin of magnetism 9594

Fibres
- high polymer, microwave dielectric meas. 285
- wool plasticity 679
- cuprene, growth kinetics 1461
- paper, moduli and int. friction 2091
- ramie and jute X-ray scattering 3079
- cellulose, i.r. absorption spectrum study 3441
- cellulose, mech. props. rel. to structure 3800
- textile, electron microscopy invest. 3808
- textile, lubrication 3834
- from synthetic polymers 6489

Field theory see also *Fundamental particles*; *Gravitation*; *Relativity, unified field theories*
- constrained and unconstrained systems, relativistic behaviour 63
- relativistic quantum field theory 64
- boson field 2nd-order current corrections 74
- wave equation solution 92

Field theory—*contd.*
- *S*-matrix in Heisenberg representation 94
- irreg. Coulomb function, asymptotic expansion 1560
- fundamental functions, deriv. evaluation 2365
- positron theory, bound states and scattering 2378
- equations of motion and wave-functions 2387
- field eq. rel. to eq. of motion 3321
- positron theory of vacuum 3322
- "conformal relativity" theory 5067
- non-local, developments 5070, 9265
- negative-energy Bose field 5071
- *D*-function of non-local fields 5072
- covariant subtraction of infinities 5073
- covariant transformation law 5074
- coupling Dirac to Kemmer field 5075
- quantum, Lorentz-invariant integration 5079
- "rare" and "true" particles 5080
- elementary particles, gauge-invariancy and divergence 5081
- gauge invariance, vac. polarization 5082
- quantum, force potentials 5105
- non-symmetric, point-charge calc. 6016, 7503–4
- formalism of linear field theories 6021
- self-coordinated field classical eq., rel. to quant. mech. eq. 6729
- quantum field dynamics 6730
- vector quantity in spin 1 particle theory? 6741*
- convergent quantum theory, "integro-causation" 7508
- non-local, consequences 7511
- local and non-local fields, difference 7512
- covariant methods of analytical mechanics 7513
- relativist. invar. canon. formalism with higher derivs. 7539
- non-linear effects 7542–3
- conventional perturbation theory 7560
- atomic physics textbook 8111
- infinitesimal canonical and unitary transformations correspondence 8495
- Schrödinger non-symmetric unif. field, eq. soln. 8498
- particle picture of quantized Bose fields 8499
- operational eq. of evolution, solutions 8501
- covariant, constraints 8502
- quantum-mech. divergences 8503
- 3 Dirac matrices, rel. 8518
- higher spin particles theory, review 8519
- spin system phase memory perturbation by mag. fluctuations 8521
- non-localizable fields 8531
- Bloch's equations, integral soln., graphical 8533
- **electromagnetic field** see also *Electromagnetism*
  - artificial equations for regions with varying μ and ε 520
  - Hamiltonian of relativity general theory 847
  - Klein Gordon equation solns. 855
  - longitudinal, quantum electrodynamics 1603
  - classical field dynamics 1604
  - renormalization methods 1605
  - non-linear interactions e.m. fields 1609
  - interactions with Birkhoff's gravitational field 1610
  - equations integration in Heisenberg representation 2363
  - gauge transformations, new meaning 2369
  - photon self-energies 2370
  - quantum electrodynamics, infinite integrals 2372
  - Feynman and Schwinger variational-principle relationships 2384
  - classical electrodynamics, self-energy subtraction 2842
  - unified field, geometric model 3315
  - relativistic quantum mechanics 3320
  - orthogonal in space-time 3646
  - divergence-free quantum electrodynamics 4086, 6022
  - energy-momentum vector 4087
  - Hamiltonian form of field dynamics 4088
  - Wheeler–Feynman theory, illustration 4089
  - conservation laws, general relativity theory 5066
  - classical electrodynam., regularization 5087
  - quantum electrodynam., canonical theory 5088
  - e.m. induction and relativity 5089
  - Heisenberg operators 5090, 7523
  - Dirac's eq. solns., Fourier transforms 5108
  - field orthogonal in space-time 5593

Field theory—*contd.*
- **electromagnetic field**—*contd.*
  - electrodynam. reciprocity theory 6026
  - quantum statistics of fields 6732*
  - *S*-matrix formalism 6733
  - quantum electrodynamics, renormalization 6740
  - manifolds of electromagnetism 7514
  - quantum electrodynamics, covariance problem 7520, 8505
  - e.m. wave-fields, matter and quantum props. 7521
  - non-local quantum electrodynamics 7522
  - Heisenberg operators in quantum electrodynamics 7523
  - scattering of light by light 7524
  - quantum electrodynam. formulation 8506
  - Schrödinger eq. in quantum electrodynamics 8507
  - quantum electrodynamics charge fluctuations 9267
  - quantum electrodynamics, operator calculus 9268
- **interactions**
  - Hamiltonian normal-dependents, elimination 75
  - in superconductivity theory 325
  - Wheeler and Feynman's direct-action theory discussed 1608
  - non-linear, between e.m. fields 1609
  - Birkhoff's gravitational field with e.m. and pair fields 1610
  - collision problems, variational methods 1616
  - T + D reaction theory 1622
  - irreducible fields and their interaction 2367
  - boson current corrections, 2nd-order 2371
  - boson electrodynamics, infinite integrals 2372
  - *Dc*-function, meaning 2373
  - closed loop, selection rules 2374
  - spin $\frac{1}{2}$ fields, transformation properties 2375
  - velocity-dependent, and nuclear shells 2917
  - new type of perturbation 3327
  - de Broglie's subtractive field and Feynman's function 3328
  - Bloch–Nordsieck covariant formulation 3330
  - nucleon-nucleon, charge independent 3331
  - energy loss by collisions in material medium 3573
  - diverging integrals in self-charge problem 4084
  - wavefields, and closed systems, theory 4091
  - charge renormalization in Hartree approx. 4098
  - $(-h/2\pi i)\partial_k$ dist. function var. 4116
  - diverging potls., and virial theorem 4117
  - matrix elements calc. 5091
  - subtractive fields theory, Lagrangian form 5102
  - electron-neutron, effect on isotope shifts 5104
  - force potls. in quantum field theory 5105
  - quantum electrodynamics interactions restriction 6024
  - inelastic collision problems, variational method 6025
  - general theory of scattering 6027
  - Dirac theory, time-dependent first integrals 6029
  - arbitrary-spin, multiple-mass particles, eq. variational deriv. 6030–2
  - Dirac theory, time-dependent first integrals 6033
  - density matrix, algebraic theory 6035
  - spin $\frac{1}{2}$ particles collision, pair creation 6738
  - ang. correl. theorem and interference terms elimination 6739, 8504
  - asymptotic phases in scattering problems, calc. 6743
  - tensor forces and saturation requirements 6745
  - electron-positron theory, alternative formulation 7510, 9264
  - system free from mass-renormalization type divergence 7526
  - particles interaction in Feynman's theory 7527
  - Coulombic potentials, bipolar expansion 7530
  - *U* operator theory 7531
  - singular potentials and effective range theory 7533
  - electron-neutron 7534
  - complex struct., particles spin different from $\frac{1}{2}$ 7536
  - 2 Dirac particles, combination system 7537
  - *S*-matrix, analytic continuation 7540
  - density matrix, algebraic theory 7544
  - atomic collisions theory 7551
  - electron-positron 7561
  - radiation corrections to Dirac's eq. 8509
  - direct, between spinor fields 8510
  - universal Fermi-type 8513
  - two electrons 8515

Field theory—*contd.*
- **interactions**—*contd.*
  - Dirac magnetic monopole with matter 8516
  - nuclear 2-body problem 9270
  - reciprocal, non-local 9273
  - four-body problems, α-particle photodisintegrations 9703
- **interactions, meson-nucleon**
  - 3-field renormalization 79
  - decay, radiative corrections 80
  - photo-meson production 82
  - spinor fields, new mode 84
  - μ-pair theories and π-meson 87
  - μ-meson scattering 639–40, 839
  - negative proton search 840
  - spinless mesons and nucleons in e.m. field 1614
  - influence on meson e.m. properties 1615
  - nucleon scattering of π-mesons 1617
  - meson scattering by nuclear particles 2376
  - four $\frac{1}{2}$-spin particles, μ-meson decay 2377
  - τ-mesons, nature 3045
  - mass and charge renormalization 3329
  - classical meson theory, radiation reaction 3334–5
  - high-energy nuclear events 3336
  - retarded, meson-exchange invest. 4097
  - scattering and absorption of mesons 4102
  - overlapping divergences and *S*-matrix 4104
  - π-meson capture in D 4692
  - μ-mesons, anomalous scattering 4756
  - radiation damping, covariant theory 5094
  - nucleons, classical eq. of motion 5097
  - 3-fold, neutral meson renormalization 5101
  - magnetic and electric poles rel. 5119
  - meson pair theory, relativistic invariance 6023
  - nuclear potential between charged nucleons 6038
  - nucleon/pseudo-vector mesons strong-coupling 6744
  - meson interaction with nuclei 6746
  - nuclear forces 7179
  - relativistic eq. deriv. 7519
  - scalar mesons self-energy 7541
  - meson scattering by nucleons 7556
  - high-energy nucleon-nucleon collisions, diff. cross-section 8514
  - magnetic moments calc. 8895–6
  - meson double scattering by nucleons 8990
  - neutral scalar mesons with point-contact repulsion 9279
  - nonlinearity in coupling 9280
- **interactions, particle/e.m. field**
  - mesons, *S*-matrix theory 77
  - normalization and mean value formulae 78
  - λ-process electron structure 81
  - light nuclei meson and electron scattering, spin interaction 639–40, 839
  - electrons with h.f. fields, quantum effects 836
  - quantum electrodynamic self-energy 837
  - subtracted field theory, new form 838
  - spin $\hbar/2$ particles, diffusion 841
  - non-relativistic limit radiative corrections 842
  - Dirac theory one-body problem 844
  - collision matrix evaluation 853
  - quantum theory formulation 1601
  - spinless charged particles quantum electrodynamics 1602
  - quantum electrodynamic self-energy 1606
  - radiation between reflecting planes 1607
  - negative-energy photon hypothesis 1611
  - bremsstrahlung theory 1612, 3325
  - spinless mesons and nucleons in e.m. field 1613–14
  - new radiation damping theory 2376
  - positron theory, bound states and scattering 2378
  - dipolar emission, anomalous decay time 3682
  - singular potentials, treatment 2393
  - Dirac's eq. in asymm. Riemann space 3332
  - Feynman and Born scatt. formulae 3339
  - electron scattering, wave-statistical treatment 3343
  - Feynman's path integrals 4085
  - generalized double Compton scattering 4092
  - gauge invariance consequences for radiative transitions 4094
  - effects on radiative transitions in nuclei 4095
  - Lamb shift for spinless electrons 4099
  - central field, relativity and spin corrections 4100

Field theory—*contd.*
interactions, particle/e.m. field—*contd.*
Dirac eq., singular solutions 4112
nuclei excitation by pos. particle Coulomb field 4709
meson production by photon/nucleus interaction 4757
Fourier expansion of Riesz potential 5092
mesons, β- matrix formalism 5093
the infrared catastrophe 5096, 6735
free electrons, quantum effects 5103
unitary affine theory appl. 6028
proton polarizability 6736
non-linear spinor fields 6742
nuclei, nuclear structure 7179
theory of internal conversion 7250
quantum electrodynamics with non-vanishing photon mass 7525
S-matrix and radiation damping 7528
radiation reaction in Wheeler–Feynman electron theory 7529
soft photon emission in radiation processes 7532
multiple elastic scattering and radiation damping 7535
Cherenkov radiation theory 7934
interaction between radiation field and ionic crystal 8346
particle exchange effect with scalar and e.m. field 8508
electron self-energy, 4th-order contribution 8517
nuclear decay in e.m. field 8912
matrix elements of transition 9269
"Bremsstrahlung" of particles with mag. mom. and spin 9529
meson field see also *Nuclear forces*
nucleon-nucleon collision bremsstrahlung 76
exchange currents in nuclei 85
Tomonaga intermediate coupling 88
protons, high-energy electron scattering 373
a 4th-order meson-equation 851
π-meson as composite particle 854
meson-emission in nuclei 1318
static meson potentials and deuteron problem 1619
photon production of mesons 2063
Bose, in photon self-energy calc. 2370
boson current corrections, 2nd-order 2371
pseudoscalar symmetrical meson theory 2381
spin-ons particles, generalized potentials 2382
gamma-ray scattering 2988
meson decay selection rules 3039
π^--mesons, absorption in H 3041
π^--mesons in D 3042
pseudoscalar and pseudovector coupling constants equivalence 3333
S-matrix theory 3337
π-meson prod., pseudoscalar theory 3338
Hamiltonian form of field dynamics 4088
H^2, H^3, He^3, He^4 binding energies 4593–5
beta-decay theory 4670
quantum field theory, Yukawa theory 5068
Dirac coupled to Kemmer field 5075
Wheeler–Feynmann theory appl. 5097
Yukawa's non-local theory 5098
ditto, D-function behaviour 8500
exchange mag. moments 5109
nuclear forces theory 5113
mixed fields method, elementary particles appl. 5114
two-meson theory analysis 5115
π-meson production—nucleon-nucleon collision 5116
meson anomalous mag. mom. 5117
meson prod., nuclear binding effect 5118
negative π-meson capture 5120
multiple production by high-energy collisions 5121
new form, fundamental eq. 5122
π-meson prod., scalar theory 5123
Bethe's neutral theory, nuclear force 6036
π-meson prod. in nucleon-nucleon collision 6748
strong spin-orbit coupling in nuclei 7179
an equivalence theorem 7294
system free from mass-renormalization type divergencies 7526
scalar mesons self-energy 7541
mesonic processes in 2-nucleon system 7545
pseudoscalar theory of deuteron ground state 7546

Field theory—*contd.*
meson field—*contd.*
neg. π-meson, absorption by deuteron 7547
vector, Stueckelberg's treatment 7550
nuclear mag. mom. derivation explanation 8134
nuclear potential in meson theory 8511
anomalous mag. mom., radiative corrections 8512
cohesive meson mass and nucleon mass difference 8522
n–p scattering corrections, new mixed meson theory 8524
neutral photomeson prod. and nucleon isobars 8525
near proton, information from electron scatt. 8772
single meson prod. by γ-quanta 8987
vector π-mesons prod. by high-energy collisions 8989
anticommutating matrices 9271
use of β-formalism 9274
quantization see also *Quantum theory*
relativistic, stationary states 65
covariant formalism 66, 7516
vacuum polarization, integrals convergence 67
symmetrical quantization 68
new method for Maxwell field 69
elementary particles theory 70, 835, 1604
higher order equations 71
Einstein's gravitational equations 72
non-local, variation principle and conservation equations 834
electron/h.f. field interaction 836
spinor fields 843
irreducible space-time volume theory 1595
light, gravitational self-energy 1600
Dyson and Feynman's $S(\sigma)$-operator 1620
closed systems energy, eigenvalues 1621
invariant construction 2366
non-superquantized formalism 2368
photon self-energy calc. 2370
time-dependent problems, variational principle 2383–4
non-local field theory 2385
angular momenta in heavy nuclei 2925
relativistic quantum mechanics 3320
many-Fermion problems, Bloch sound-wave method 3324
radiation field configuration transformations 3323
2-electron angular wave functions 4082
generalized Hamiltonian dynamics 4083
Feynman's path integrals 4085
Hamiltonian form of field dynamics 4088
spin models possibility 4110
spin rel. to statistics 5076
longitudinal field, time reversal 5077
second quantization calc. 5078
generalized transformation function 5083
ambiguities in quantized theories 5084
Dirac's new method 5085
second, and configuration space in relativistic particle theory 5086
gauge-spin transformations in wave eq. 5107
time reversal and Dirac eq. 5110
field eq., eq. of motion and wave-functions 5127
particles of spin 0 or $\hbar$, wave eq. 5128
Dirac wave functions in central field 5130
relativistic invariance in meson pair theory 6023
electrodynamics reciprocity theory 6026
factorization ladders and eigenvalues 6037
transition probabilities calc. 6039
vector part. in Coulomb field, energy levels 6044
quantized field theory 6731
eigenvalue problem 6752
Schrödinger eq. soln. for approx. atomic field 6753
real fields 7515
2nd quantization, positron theory 7517
local, covariant method 7518
relativistic eq., deriv. for interacting particles 7519
causality in elementary particle theory 7549
perturbation theory, discontinuous spectra 7555
ditto, continuous and mixed 9282
symbolic calc., appl. to Dirac perturbation method 7558
Coulomb scatt. wave functions, momentum 7559
torsional oscillator 7562

A complete list of the Subject Headings will be found at the end of the Index.

- **Field theory**—*contd.*
  - **quantization**—*contd.*
    - generalized wave-eq. theory 8529
    - classical field mechanics study 8530
    - numerical variational method 8534
- **Films**
  - **liquid** see also *Adsorbed layers*; *Contact angle*; *Surface tension*
    - critical area, evaporation through 114
    - unsteady-state diffusion 125
    - He II, transport meas. 261
    - He II, transport rates 6931
    - lubricants 866
    - desorption, press. and chain length effect 874
    - polar silicones, surface properties 1454
    - He II, thickness meas. 2629
    - lubricating, hydrodynam. forces 3363
    - "gaseous," at oil-water interface, potential study 3502
    - boundary layer, lubrication function 3836
    - lubricant, rheology 3848
    - mineral oil extreme press. lubrication 4141
    - silicone, electron diff. study 4590
    - water vapour on solids, thickness 5642
    - He II, transport effect peculiarities 6929
    - He II, sub-critical flow 6930
    - surface, effect on water ripples 7594
    - constant-area surface layers, desorption 7598
    - ion dist. under charged monolayer 7599
    - oil-water interfaces, adsorbed films 9083
    - emulsions, non-negligible thickness, light absorption 9394
    - use as hygrometer 9797
  - **solid** see also *Membranes*; *Optical films*; *Thickness measurement*
    - high polymer, microwave dielectric meas. 285
    - Al oxide, diel. strength 293
    - scattering of electrons 371
    - controlled thickness, evaporated 662
    - electrodeposited, electron microradiography 777, 6672
    - metal, i.r. absorptivity, bolometer appl. 922
    - interferometric thickness meas. 988–9, 1767, 4305, 6895, 6897
    - evaporated Fe in air and N, contact potentials 1033
    - Ni, adsorbed gases, surface potentials 1034
    - adsorbed on metal, surface potential det. 1035
    - Ag, electrical conductivity in intense fields 1047
    - Ba, photo-ionization 1119
    - stratified, e.m. wave propagation 1199, 2575
    - hydrocarbon mono- and multilayers, structure 1344
    - Al_2O_3, porous, capacity 1345
    - Ba, absorption of N 1346
    - carbon targets prep. 1347
    - evaporated metal, graticule production 1348
    - Ag, Au, Sn, evaporation in electron microscope 1349
    - metal, orientated overgrowths 1350
    - $Cd(OH)_2$ on Cd crystal, effect on creep 1377
    - Ni, Fe and Pt, orientation effect on hydrogenation 1407
    - Cu oxide, surfaces reactions and catalysis 1413
    - heats of adsorption det. 1449
    - metal, evaporated; gas adsorption 1452
    - order-disorder process in alloy films 1518
    - on glass, interferometric meas. 1768
    - Sb, Hall coeff. and resistivity 1827
    - Mg_3Sb_2, photoconductivity 1843
    - metallic, mag. field effect on elec. conduct. 1853
    - metallic, electron freeing invest. 1957
    - lead sulphide, structure 2084
    - Rehbinder effect invest. 2112
    - phase-shift meas. amplification 2580
    - O–Cs, optical and photoelectric character 2694
    - nylon and formvar, β-ray abs. 2748
    - KCl, secondary electron emission 2750
    - Au, containing W oxides 3070
    - fatty acid and soap on metal, orientation 3071
    - aliphatic esters and alcohols, ditto 3072
    - low temp. Cu oxidation 3073
    - electron diffraction exam. 3081
    - adsorptive layer, phase state 3161
    - scintillations from α-ray bombardment 3462
    - metals, polarized light study 3465

- **Films**—*contd.*
  - **solid**—*contd.*
    - Bi, resistivity and Hall coeff. 3516
    - Fe, elec. conduct. at low temp. 3530
    - Zn and Cd evapd. layers electron microscope exam. 3810
    - monomolecular layers, adherence to support 3833
    - boundary lubricant monolayer, structure 3846
    - extreme-pressure additives, mechanism 3847
    - lubricant, adsorption study 3850
    - evap. W, H chemisorption 3877
    - on glass, interference colour 4306
    - complex, for interferometry, production 4307
    - oxide layer on Al, diel. less meas. 4368
    - Se, elec. props. 4387
    - ferromagnetic, maj. props. 4528
    - thick target for synchrotrons and betatrons 4778
    - oxidation, meas. 4779
    - evap. Al, blister formation 4780
    - condensed *in vacuo*, review 4781
    - Rh filters, density control 4782
    - Au, lattice distortion spectrum 4783
    - thickness meas., radioactive tracer method 5140
    - metallic, phase and intensity meas. tables 5314–15
    - dielectric, conductivity under electron bomb. 5412
    - insulator, electric tunnel effects 5447
    - KCl, slow electron interaction 5465
    - semiconducting, thermionic emission 5510
    - Ni foils, study 5816
    - Rh on Perspex 5817
    - evap. ZnS, study 5818
    - Ge, amorphous structure 5820
    - Au, etched, electron diff. pattern anomalies 5822
    - Au, crystallization 5901
    - Ag on NaCl 5906, 5930
    - thickness meas. 6144
    - electrodeposited, interferometric exam. 6146
    - polymer bi-films, thermo-mech. effects 6166
    - Fe, low temp., elec. resist. 6209
    - Te, resistance, Hall effect, magneto-resist. 6218
    - on cathodes, effect on spark pot. 6235
    - on Ta, by evap. from cathode 6264
    - sulphide on Cu, electron diffract. study 6495
    - evap., alignment chart for thickness 6496
    - e.m.f. in tarnishing 6532–3
    - Pb telluride, prep. and photoconductivity invest. 6974
    - Ni, ferromag. resonance absorption 7080
    - prep. for elec. diff. studies 7309
    - adsorbed, radioactive tracer invest. 7354
    - interferometric study, fringes shape 7781
    - oxide, elec. charac. invest. 7852
    - Ge, elec. props. 7873
    - metallic, evap., elec. conductivity 7887
    - superconductivity, surface energy 7904
    - evap., colloidal-crystalline state 8239
    - vac. evap. by electron bombardment 8247
    - Ag–Mg alloys, evap., prep. 8248
    - replica production by hydrocarbon electronic bombardment 8252
    - lubrication of metals 8278
    - Au, influence of substrate on cystallization 8339
    - Ag, containing gaps, elec. conductivity, temp. dependence 8726
    - C, elec. conductivity 8733–4
    - metallic on molybdenite, electron diff. study 9016
    - oxide, rupture in sliding 9039
    - Cu low-temp. oxidation rate, anisotropy 9045
    - oxide on Zn foil, formation kinetics 9056
    - surface layers, X-ray thickness meas. 9130
    - theory of electrical conduction 9462
    - elec. resistance, theory of variations 9479
    - Bi, thermoelectric power 9498
    - Al_2O_3, orientation effects 9741
    - oxide on Cu–Mg alloys, electron diff. study 9742
- **Filters, optical** see also *Absorption, light*; *Optical films*
  - electrical colour-filters 1779
  - Tl bromoiodide i.r. spectrophotometer appl. 2075
  - gelatine, new cement 2549
  - illuminant-converting, for automatic tristimulus integrator 2550
  - interference, for specified wavelengths 3464
  - multiple-layers, narrow band-pass 5318
  - interference, polarizing, temp. effect 7453

Filters, optical—*contd.*
  interference, for solar study 7454
  for Hg 3 125 and 2 537 Å lines isolation 7688
  interference, phase plate appl. 7779
  interference, new technique 7780
  u.v. dichroic filters 8646
Fission see *Nuclear fission*
Flames see also *Spectra, flames*
  Bunsen, production and appl. of shadow 259
  effect of S on C formation 260
  C burning glow, spectrum 940
  non-luminous, spectrophotometer temp. meas. 1013
  composition limit of propagation 1014
  explosion, thermal radn. and chemiluminescence 1760
  initial temp. effect on vel. 2617
  propane-air, quenching distance and inflamm. limit 2618
  l.p. spectroscopic evidence for abnormal excitation 2619
  integrating flame photometer 3423*
  burning velocity of hydrocarbons 3493–4
  in methane-air combustion 3495
  methyl ethyl ketone cool flame 3496
  review article 3492
  as spectrochemical light source 4326
  gas composition calc., analogue computer 4339
  in l.p. combustion chambers, temp. meas. 4340
  burning vel., ethylene + air + CO_2 4826
  flow from heat source, graphical study 5345
  turbulent, invest. 5355
  temp. meas. from u.v. OH band emission 5356
  vel. correl. with hydrocarbon struct. 5357
  flame front influence on flow field 6926
  chemical ionization hypothesis 7335
  OH band rotational intensity dist., invest. 7671
  graphical study, thermally variable systems 7799
  rocket exhaust, spectroscopic vel. and press. meas. 7814
  temp. dist. along radiating gas stream 7815
  propagation in gaseous mixtures 8284
  diffusion, radiation study 8691
  effect of turbulence on propagation 8692
  deviation of gases 8693
  anomalous shapes 9425
  cool, with ethylene 9763
  propagation theory 9764
Flares, solar see *Prominences*
Flocculation see *Sedimentation*
Flow see also *Diffusion*; *Jets*; *Plastic flow*; *Turbulence*; *Viscosity*
  compressible fluids, differential equations soln. 132
  incompressible vortex, hodograph transformation 868
  fluid flow conference 2410
  in viscosimeter design 3358
  hydrodynamics textbook 3361
  equations of motion 3362
  3-dim., boundary layer 3369
  grease, worker-consistometer meas. 3870
  through porous metals 4144
  non-Bingham plastic solids, non-Newtonian viscous liquids 5828
  fluid flow affinity, thermomech. 6185
  air and ocean currents, momentum flux 6639
  through Laval nozzle thermodynamics and chem. kinetics 6772
  glaciers and ice-sheets as plasticity problem 7401
  flow with spherical boundary 9296
  axially symmetric, equations 9301
 gases see also *Aerodynamics*; *Anemometers*; *Supersonic flow*
  in rocket motors 103, 6051
  gases and H_2O vapour through wood 122
  unsteady, near plate 131
  perfect gas in Laval nozzle 135
  turbulent, hot-wire anemometer invest. 139
  transonic, compressible, through nozzle 869
  vapour flow in diffusion pump 883
  3-dim., compressible, asymptotic expansion 884
  transonic potential flow 885
  Prandtl–Meyer, plane rotational 886
  Prandtl–Meyer, behind shock wave 887
  burner tube, irreversibilities effect 888

Flow—*contd.*
 gases—*contd.*
  compressible flow, linearized theory 889
  conical, interferometric test 890
  boundary layer velocity fluctuations 891
  low velocity meas., manometer 893
  reaction turbine, characteristic function 1658
  rel. between boundary layer and evaporation problems 1659
  rarefied, in tubes, formulae 2437
  plane flow approx. compressibility laws, eq. 2442
  approx. permanent, 2- and 3-dim., theory 2443
  discontinuity surface between 2 mutually perp. flows 2444
  along cylinder with conical nose 2445
  fibrous materials permeability 3065
  lab. apparatus design 3388–9
  through mass spectrometer viscous leak 3392
  sound-wave propag. eq., inconsistency 3395
  velocity dist. round symmetrical profile 3397
  axially-symmetric flow patterns det. 3398
  Hermite, eq. soln., new form 3399
  revolute, detached shock wave 4166
  compressible flows, review 4167
  mixed, generality 4168
  polytropic gas, Prandtl–Meyer 5168
  behaviour, separation of mixtures, in vortex tubes 5169
  Ertel's vorticity theorem 6058, 8552
  transonic, relaxation methods appl. 6075
  in wake of thin plate 6787
  in porous media 7604, 8569
  turbulent, complete forms 7614
  high spread, inteferometric study 7780
  porous medium, steady state 8570
  ditto, transient state 8571
  effect of acoustic relaxation 8579
  compressible, past cylinder, M^2-expansion appl. 8577
  compressible, subsonic, past Rankine ovoid 8578
  modified Hilsch apparatus 8700
  thermal diffusion, visible patterns 9327
 liquids see also *Double refraction, flow*; *Hydrodynamics*; *Superfluidity*
  non-Newtonian liquids, rel. to shear 110–11
  boundary layer, past solids of revolution 867
  cylindrical, surface ripples 873
  fluidity, ionic elevation 1425
  emulsions 1441
  laminar, turbulent, transition 1643
  Bernouilli's compressible viscous fluids theorem 2412
  viscous, in semi-infinite channel 2414
  unsteady, in infinite channel 2417
  elastic dispersions 3365
  convective in porous medium 3367
  cohesionless granular bed movement 3370
  motions in rotating liquid 3371
  movt. due to elastic sediments compaction 3962
  viscous, visible streamline expts. 4143
  stress relax., conc. polymer solutions 6054
  fluid mappers 6056
  critical regimes with density stratification 6057
  vorticity theorem appl. 6058
  oil layer study 6770
  He II film, peculiarities 6929
  He II film, sub-critical flow 6930
  He II film transport rates 6931
  viscosity temp.-dependence 7587
  water, very low velocities meas. 7592
  under interfacial tension 7596
  viscous, asymptotic behaviour far from obstacle 8545
  viscous, between parallel planes, stability 8546
  transverse wave propag. in eddy filaments 8549
  viscoelastic, secondary stresses 9035
  pseudoplastic, viscosimeter meas. 9295
  turbulent, in 2-dimensional channel 9299
  turbulons interaction 9302
  pipes
  h.p. investigation apparatus 1386
  core waves in swirling liquid 3368
  secondary circulation after bends 5144
  turbulent, in smooth pipe, heat transfer 8681
  pressure surges 9304

Flowmeters see also *Anemometers*
  wet test gas meters 138
  ultrasonic method for water 1645
  porosity data, fibrous media 3065
  electromag., for transient flow 4146
  v. low velocity water flow 7592
  linear-resistance, study 7619
  orifice, with supercritical compressible flow 7620
Fluctuations see also *Brownian movement*; *Random processes*
  communication theory and physics 1594
  particle random movement "velocity" 1628
  linear system with periodically-varying parameters 2396
  information theory conference 2482
  well-informed heat engine 4358
  in nuclear evap. process 5690
  nucleon cascade, av. number calc. 6447
  thermodynam. fluctuation theory formalism 9434
 electrical
  shot effect, correlation statistics 16
  noise factor, theory and meas. 303
  frequency noise source 304
  contact noise in semi-conductors 314
  a first-passage-time problem 788
  noise, statistical models 791
  oscillating circuits noise-spectrum reduction 1825
  biological noise 2238
  analysis, Brownian movt. appl. 3344
  electron beams noise, space-charge and transit-time effects 3567
  scintillation counter resolving time limitations 3588
  auto-correlation anal., appl. 4119
  noise in dialectrics 4410
  Ta Schottky effect periodic deviations 4489
  galactic radiowaves 4956
  shot and Johnson noise theory 5400
  d.c. gas discharge plasma 5435
  ditto, noise temperature 3545
  level in metals after tempering 6207
  in travelling wave beam 6257
  in double diodes 6286
  oxide cathode Schottky effect 6294
  irreversibility and generalized noise 6759
  photoresistor performance limits 6970
  meas. by valve voltmeters 6982
  electron temp. rel. to noise temp., Hg–A discharges 6993
  in electron cascades, and gen. dist. problem 7050
  noise function, arbitrary power spectrum 7846
  energy distrib., randomly modulated waves 8069
  solar noise at 3300 Mc/s, analysis 8451
  decaying electrets. noise 8724
  discharges electron temp. det. by noise meas. 8751
  random noise, phenomenological models 9456
  l.f. noise, generation and meas. 9458
  nonlinear impedance power spectrum 9459
  "flicker" effect, rival theories 9461
  electron-photon cascade shower theory 9530
Fluorescence see *Luminescence*
Fluorescent screens see also *Luminescence*
  cathode-ray, phosphors adhesion 1753
  viscosimeter recording apparatus 4987
Fluorine
  zero-pressure thermodynamic properties 275
  thermodynam. functions 2649
  heat of dissociation 7827
Fluorite
  thermal expansion 1476
  refractive index, 7 to 15 μ 2576
Foams see also *Bubbles*
  surface-tension lowering rate effect 2138
  frothers for paraffin wax 6061
Fog
  particles, charge meas. 1068
  light reflection and extinction coeffs. 3238
  electrical coalescence 4941
  artificial precipitation disc. 4942
  visible and i.r. radiation propag. 4946
  mist-water interface boundary conditions 6778–9
  sound absorption 7639
  drop-size formula 9213
Force measurement see also *Dynamometers*
  rapidly changing quantities, pickup and oscillograph methods 4132
  with inductive pick-ups 6766
Fourier analysis see also *X-ray crystallography, analytical methods*
  simple summation machine 9
  and synthesis, analogue computer 3258
  curve approximation by sine functions 3266
  summation, optical method 5002
  charge dist. in crystals, phase factors table 5916
  calc., two uses of optical machine 8352
Fractionation see *Distillation*
Fracture see also *Breaking strength*
  and flow, of brittle material 676
  crack propagation in glass 685
  glass, surfaces invest. 1382
  type II diamonds 4896
  metals scabbing 5812
  fatigue, of steel 5836
  delayed, in Cu creep 5837
  nature of "viscous" fracture 6487*
  moving Griffith crack 8274
  by fatigue, of metals and methyl methacrylate, analogy 8276
Freezing see also *Melting point*; *Supercooling*
  unsteady-state diffusion 125
  freezing nuclei function in supercooled water 3386
  Stephan's linear problem, alternating phases 3482
  silica sols studies 4858
  water droplets and aq. solns. 4942
  supercooled water 9420
Friction
  electrostatic component 866, 3844
  roughness effect on sliding drops 876
  in plastic bodies 1372
  relaxation oscillation 1383–4
  physical process in brake action 1631
  in scratching and cutting contact 2113
  Föppl's rolling friction theory 2114
  dry, deterioration processes 3105
  rubber on ice 3106
  var. with temp., 4°–600°K 3107, 6519
  resin-bonded powders 3828
  boundary, factors affecting 3835
  boundary layer function 3836
  boundary lubricant scuffing temp. 3837
  coeffs. using solid lubricants 3838
  rough steel, metallic-soap lubricated 3839
  metals, fatty-acid lubricated 3840
  physical changes on scuffing 3841
  in abrasive processes, lubrication effect 3842*
  surface damage, radioactive invest. 3845
  surface welding, prevention 3847
  mixed liquids props., and spreading 3849
  W carbide and bonded carbides 4808
  static, statistical features 5842
  new apparatus for invest. 6050
  dry, and electric contact 6520
  clean metals, adsorbed films 8278
  metallic transfer, autoradiographic study 9036
  theory of several phenomena 9037
  diamond, graphite, etc., surface films 9038
  rupture of oxide films 9039
 internal see *Elastic losses*
Functions see also *Bessel functions*; *Mathieu functions*
  spherical harmonics, Coulomb potential expansion 4
  irregular Coulomb, asymptotic expansion 1560
  electrical representation app. 2300
  impulse, finite representation 3251
  periodic, average value 3253
  Laplace, conditional stationary 4994
  boundary-value problems, pointwise bounds 7446
  one-sided Green's function 7447
  non-Hermitian operators and eigenfunction expansions 8421
  Green, estimates 8422
  enforced oscillations in arbitrary domain 8587
Fundamental particles see also *Atoms*; *Field theory, interactions*; *Nucleus*; *Quantum theory* and individual particles, e.g. *Electrons, Mesons,* etc.
  theory using differential equations 70
  relativistic wave-particle, Galilean approximation 89

Fundamental particles—*contd.*
  de Broglie's theory 90
  trajectory analysis in moving reference system 366
  light particles from cosmic-ray disintegration 462
  rel. to universal constants 824
  association laws hypothesis 831
  quantum theory 835, 1604
  ditto, causality problem 7549
  spin $\hbar/2$, diffusion theory 841
  higher spin, magnetic moments 848
  mass prediction 849
  mass relationships 850
  π-meson as composite particle 854
  exclusion principle foundation 860
  identification in electron-sensitive plates 1556
  irreducible space-time volume character 1595
  charged, spinless, quantum electrodynamics 1602
  Wheeler and Feynman's direct-action theory discussed 1608
  spin $> \frac{1}{2}$, spectral decomp. 1624
  high-energy, ionizing, tracks structure 2030
  magnetic monopole, ionization along path 2064
  charged, relativistic ionization increase in emulsions 2278
  track identification in emulsions 2285
  relativistic, energy losses in photographic plate 2286
  proton and neutron mag. moments 2379
  shower generating, instability 2787
  are mesons complex? 3040
  energy loss in material medium 3573
  relativistic, radiation in mag. field 3574
  negative but distinct from electron 3734
  μ-mesons structure, scattering on protons 3789
  new unstable neutral particle, evidence 3793
  canonical transformation in arbitrary spin particle theory 4030
  transmutation, change of spin 4105
  wave theory, review 4111
  nucleon hard-sphere model 4454
  new high $(H\rho)$, electron-producing 4658–9
  v. fast particles, recent exptl. work 4689
  spin rel. to statistics 5076
  "bare" and "true," field theory 5080
  gauge-invariancy and divergence 5081
  relativistic theory, 2nd quant. and config. space 5086
  definition in presence of strong couplings 5106
  spin treated as rotation 5112
  theory, mixed fields method, appl. 5114
  spin 0 or $\hbar$, formalism and wave eq. 5128
  Dirac, in central scalar field 5130
  proton/electron mass ratio 5382
  potential well energy-level perturbation 5657
  geometrical introduction in unitary affine theory 6028
  arbitrary-spin, multiple-mass, eq. variational deriv. 6030–2
  heavy, charged, energy meas. by emulsions impregnation 6269
  V-particles, decay 6297
  new unstable particles, cloud-chamber study 6300
  nucleon cascade fluctuation 6447
  Darling's theory and π-meson mass 6475
  "fundamentons" 6724
  quantum field dynamics 6730
  proton polarizability 6736
  de Broglie's spin 1 particle theory 6741*
  whirl theory, gravitation appl. 7507
  spin $\neq \frac{1}{2}$, complex structure possibility 7536
  2 Dirac particles combination system 7537
  definition of Hertz vectors 7538
  collisions of 1 particle with particle system 7551
  inertia of carrier of electricity, Cd 7848
  of higher spin, review of theory 8519
  positron inner parity 8520
  nucleon mass diff. and cohesive meson mass 8522
  free magnetic poles, passage through matter 8833
  nucleon mag. moments calc. 8895–6
  Heisenberg's theory 9263
  de Broglie spin 1, "Zitterbewegung" 9276
  V^0 particles decay prod. 9579
Fusion see *Heat of fusion*; *Melting point*
Galaxies see also *Milky Way*; *Nebulae*
  rotation, Kovalsky's study 41
  distribution, rel. to irregular absorption 45
Galaxies—*contd.*
  galactic noise, review 792
  r.f. radiation, 100 and 200 Mc/s survey 796, 799
  r.f. radiation, discrete sources 797
  structure, r.f. observations 798
  r.f. radiation from nebula in Andromeda 1576
  near, photometric study 1586
  dist. and origin of hot giants 2347
  hot giants dist. in outer parts 2348
  spherical, stellar dynamics 3292
  elements of orbits 5040
  dist. in Magellanic cloud 5041
  stellar populations, effect of collisions 5043
  stars with reverse movement 5998
  red-shift hypothesis 8442
Galena
  elastic constants 8259, 9132
Gallium
  de Haas–van Alphen effect 1176
  anisotropy and crystal structure 2163
  critical mag. field 6979
Gamma-ray spectra
  from π^--meson capture in H 1300
  n-capture study 2022
  from π^--mesons absorpt. in D 2023
  μ-meson decay 2061
  complete reference tables 2938, 6402
  from p-bomb. of light elements 3005
  energy rel. to half-period in K-capture 3724
  diffusion through matter, effect 4672–3
  from π^--meson capture in H and D 4691, 9724
  neutron capture, odd-even effect 4736
  from abs. of π-mesons by D, calc. 5739
  Compton electrons, accurate, focusing 6254
  electron-gamma ang. correl. meas. 8937
  neutron capture spectra, scint. counter studies 8942
  review 9668
  $\mathrm{Ag}^{105-6,\ 110-11}$ 585, 1268, 1288, 6430, 6432, 8922, 9671
  Al isotopes 8177, 9676
  $\mathrm{As}^{74,\ 76}$ 4680, 5701
  Au^{198-9} 2020, 2980, 2985, 8175, 8928
  $\mathrm{B}^{10,\ 11} + d$, B^{12} 6415, 8196
  $\mathrm{Ba}^{131,\ 135}$ 594, 2982, 2987, 7220, 8944
  $\mathrm{Be}^9(\alpha, n)$ 2993
  Be^8, from electron pairs in emulsions 4685
  Bi^{207} conversion spectra 5688
  Bi n capture 5728
  $\mathrm{Br}^{77,\ 82}$ 8936, 8939
  C, Cd, Cl n-capture 1315
  Ca^{41} decay 7215
  Cd enriched isotopes 573
  $\mathrm{Cd}^{111,\ 115}$ 585, 6408
  $\mathrm{Ce}^{133,\ 137,\ 139,\ 141,\ 143-4}$ 571, 2948, 5726, 7246, 8170, 8929
  $\mathrm{Cl}^{34,\ 39}$ 1996, 2972, 8169
  Co^{60} 2020, 4671, 6433
  $\mathrm{Cs}^{131,\ 134,\ 137}$ 594, 1268, 4671, 7213
  Cu neutron excitation 7281
  D, neutron radiative-capture 3032
  $\mathrm{F}^{17,\ 20}$ 2005–6, 2947, 8162
  F neutron capture 8177
  $\mathrm{F}^{19}(d)$ 8196
  Fe neutron excitation 7281
  Ga^{66} 2020–1, 2959
  Gd isotopes 567
  $\mathrm{H}^3(p, \gamma)\mathrm{He}^4$, excitation curve 8961
  $\mathrm{Hf}^{175,\ 179,\ 181}$, etc. 2004, 4650, 6434, 6437, 7219
  $\mathrm{Hg}^{197,\ 203}$ 5698, 8157
  H^{160-4} 568
  $\mathrm{I}^{126,\ 131,\ 132}$ 2980, 4647, 4663, 5705*, 6412, 8933–4, 8941
  In^{116} 587
  Io internal conversion tracks 6419
  $\mathrm{Ir}^{192,\ 194}$ 1268, 5708, 6437
  Ir, new isotopes 566
  K^{40} 5725
  $\mathrm{Kr}^{79,\ 83,\ 85}$ 572, 580, 4651, 6424
  Kr, new activity 569
  $\mathrm{La}^{131,\ 132,\ 140}$ 5704, 9672
  Li α-capture 4696
  $\mathrm{Li}^7(p, \gamma)$ 7259
  Lu neutron-deficient isotopes 4650
  Mg^{24}, high-energy γ-ray 7244
  Mg neutron capture 8177

A complete list of the Subject Headings will be found at the end of the Index.

Gamma-ray spectra—*contd.*
Mn^{55} 8940
$\mathrm{Mo}^{93,\,99}$ 2973, 4642, 8169
$\mathrm{N}^{14}(d)$, N^{16} decay 3741, 8196
Na^{24} 2020, 7210
Na neutron capture 8177
$\mathrm{Nd}^{139,\,147}$ 2948, 6409, 6431, 7218, 8170
Ni^{57} 1274, 8936
Np^{236} 6420
$\mathrm{Os}^{182-3,\,185,\,191,\,193}$, etc. 588, 1275, 5714, 7217
$\mathrm{P}^{31}(p_-, \gamma)\mathrm{S}^{32}$ 5749
P^{32} continuous 7245
P^{33} 8914
$\mathrm{Pa}^{231,\,233}$, etc. 571, 6435, 7222
Pb^{206} 4676
Pb neutron capture 5728
Pm^{149} 6409
Po isotopes 4649, 6439, 7222
$\mathrm{Pr}^{138-9,\,142-4}$ 2943, 2948, 8170, 8929
Ra and daughter products 8943
RaC′, no fine structure 2015
RaD crystal spectrum 3744
RaD conversion and Auger electrons study 9679
RaE, continuous 7245
Rb isotopes by α on Br 2942
$\mathrm{Rb}^{86,\,88}$ 2974, 2978, 5713
Re^{186} 5707, 7212
Rh^{104-5} 6437, 7242
$\mathrm{Ru}^{103,\,105}$ 570, 3731
$\mathrm{Sb}^{120,\,122}$ 2939, 6437
Sc^{46} 1269, 6437
Se^{77m} 6437, 6441
Si neutron capture 8177
$\mathrm{Sn}^{117,\,119}$ 595, 8945
Sr^{87m} 2960
Ta^{181-2} 1289, 2004, 4677
Tb^{153-7} 568
Tc^{99m} 2973, 7204
Te^{125} 2984
ThC″, 2·62 MeV 6438
$\mathrm{Tl}^{199,\,200}$ 9656
UY (Th^{231}) 5706, 7229
W^{186} 5707
$\mathrm{Xe}^{129,\,131,\,133,\,135}$ 581, 4651, 6405, 6424, 8933
Y^{87} 2960
Yb^{169} 5689
Zn^{65} 6429
Zr^{89}, etc. 5715, 7214, 8924

Gamma-ray spectrometers see also *Beta-ray spectrometers*; *X-ray spectrometers*
scintillation, for high-energy rays 1291
ditto, low energy 2980
NaI(Tl) crystals use 2020–1
coincidence scintillation 2767
G.M. counter efficiency 3583–4
G.M. counter and ion-chamber, comparison 3751
C^{12} photodisintegration appl. 3768
2-crystal, results with uncollimated rays 4671
deuteron disintegration 5775
3-crystal scintillation 6440, 9673
magnetic spectrography, Po and Pa appl. 7222
artificial radioactive subst. spectrometry 8168
scint. spectroscopy Mn, slow neutron capture 8940
review, 8166, 9668

Gamma-rays see also *Cosmic rays, photons*
Ba^{131}, Cs^{131}, coincidence studies 594, 5727
proton coincidences in (d, p) reactions 613
production by absorption of meson by proton 642, 5724
delayed coincidences Hg^{198} study 1267
D-loaded emulsion study 1292
multiple electron-pair production 1296
resonances from p bombardment of P 1304
high-energy, G.M. counter and emulsion response 1878
Cd^{115} 43-day isomer, β–γ and γ–γ coincidences 1993
from Ag^{110} 2017
from d on C^{14} 2041
1- and 2-quantum annihilation in motion 2986
K salts γ-activity 3726
3-photon annihilation, electron-positron pair, meas. 3748
from n-capture by Be, C, N 3752

Gamma-rays—*contd.*
primary cosmic gamma-radiation, search 4499
octupole transitions, matrices 4678
Cl^{36*} γ-level, natural width 4679
polarization detect. by pair production 4686
relative photo-fission cross-sections 4719
U^{238} resonance photo-fission cross-section 4720
positronium formation evidence from time delays 5380
internal pair creation 5718
from polarized (n, γ) reactions 5787, 8948
gamma radiography, review 5968, 9898
β-decay, γ-quantum correl. with β-electron 7228
exchange effect with deuteron 7238
β-emitters, continuous γ-radiation 7245
from 0^{16*}? 7263
from $\mathrm{Be}^{9}(d, n)\mathrm{B}^{10}$, search 7265
high-energy, proton production 7268
production in nucleon collision by meson decay 7286
origin and props., elementary review 8166
Cu^{64} radiation, β and γ coincidence 8167
high intensity source 8307
Zn^{65}, positron to γ-ray ratio 8925
high-energy bremsstrahlung and pair production 8950
from p to Al 8964
B^{12} and Li^{8} $\beta\gamma$ coincidence 9662
K^{40}, coincidence with Auger electrons 9678
yield from protons on Cl 9692

absorption
resonance abs. freq., hydrodynamic calc. 1231
from Co^{60}, penetration and diffusion in water 1290
Klein–Nishina radiation formula 1298
M.I.T. cyclotron concrete wall attenuation 1334
thickness meas. 2403
formulation in various materials 3746
meas. method using annihil. radiation, **Pb**, **Cu**, **Al** 3754
high-energy, fundamental eq. 4672–3
coeffs. meas. 4674
transmission through thick, heavy matls. 4675
photo-nuclear reactions model 4725
280 MeV total cross-sections in Be, Al, Cu, Sn, Pb, U 5772
self-, large sources, correction 7247
Cu^{63} cross-section 7274
in water and lead, calc. 7929
elementary review 8166
in Pb, from ThC″, electron pairs ang. dist. 8179
corrections for Ra standardization 8911

angular distribution
$\mathrm{Li}^{7}(p, \gamma)\mathrm{Be}^{8}$ 1302, 6454, 7259
ThD 1969
Compton effect, conservation laws verification 2989
annihilation-quanta ejected photo-electrons 4681–2
$\mathrm{Li}^{7}(d, n\gamma)$ 5754
thin-target bremsstrahlung 7020
Au^{198} decay, scint. counters appl. 7211
in nuclear reactions, review 7251
ang. correl. in triple cascade transitions 8156
theoretical expression 8176
isotropy in nuclear γ-radiation 9677
correl. with p from $\mathrm{Li}^{6}(d, p\gamma)\mathrm{Li}^{7}$ 9699
α–γ angular correlation 583, 2962–3
ditto, $\mathrm{F}^{19}(p, \alpha)\mathrm{O}^{16*}(\gamma)\mathrm{O}^{16}$, 1301
ditto, from p on F 3000
β–γ angular correlation 589, 7239
ditto, Mn^{56}, Au^{198}, As^{76} 2940
ditto, Sb^{124}, energy dependence 8935
γ–γ correl., higher multipoles 6436
ditto, from A^{38} 2016
ditto, from Mg^{24} 2979
ditto, Cu^{65} 7243
ditto, annihilation quanta 3743, 3749, 8953
ditto, 2^{L-1} mag., 2^{L}-elec. interference terms 3747

detection, measurement see also *Counter tubes*; *Counters*; *Gamma-ray spectrometers*; *Radiation monitoring*; *Radioactivity measurement*
photosensitive G.M. counters 1878, 3582
scintillation counter 1884–5
ditto, abnormal efficiencies 2024
NaI (Tl) method 2021
photographic film 2726, 5957

- **Gamma-rays**—*contd.*
  - **detection, measurement**—*contd.*
    - absolute measurement 3022
    - thresholds meas., momentum unbalance method 3024
    - radiological units, internat. recommendations 3554, 9877
    - wide energy range, review 3555
    - survey of techniques 5684
    - in reaction Be^{9}(α, n) C^{12} 6450
    - qualitative, colorimetric dosimeter 6538
    - drill-hole logging, neutron, gamma method 6617
    - self-absorption correction, large sources 7247
    - energy det. by photoelectric electrons absorption 7248
    - elementary review 8166
    - coincidence meas. Nd^{147}, Ce^{144}, Pr^{144}, Ce^{143} 8170
    - dosimetry, review 8405
    - aerial prospecting 9844
    - dosage control in interstitial therapy 9884
  - **effects** see also *Nuclear reactions, photons*
    - low-intensity cytological effects 1548
    - stars, statistical invest. 2029
    - isotopic separation by (n, γ) recoil 4625
    - on biological systems 4973
    - high-energy photo-nuclear reactions, transition curves 5766
    - star production, mechanism 5768
  - **internal conversion**
    - gamma quanta electron conversion 591
    - beta-emitting isotopes, statistical study 1283
    - in L_I-shell 2981
    - transuranium elements, L X-ray spectra 3750
    - directional correl. of successive electrons 3753
    - ang. correl. 1st and 2nd transition multipoles 7239
    - K-shell coeffs. 7249
    - theory 7250
    - Ag$^{109*, 110}$ 2017, 4684
    - Am^{242} 1992
    - Au^{198} 3728
    - Ba$^{131, 133, 135}$ 594, 8944, 8947
    - C^{14}–N^{14} β-decay 2970
    - Cd^{111m} isomeric level 8921, 8952
    - Ce^{144} 7246
    - Cl$^{34, 39}$ 1996, 2972
    - Co^{60} 2018
    - Cs$^{131, 134, 137}$ 594, 2018–19, 7213, 8952
    - Eu^{153*} 1999
    - Hg^{197} decay 1272
    - In^{116} 587
    - Io → Ra transition 4683, 8951
    - Hf isotopes 7219, 8946
    - Hg$^{197, 203}$ 2940, 5698, 8157
    - Ho^{166} 3728
    - Lu^{177} 3728
    - Mg^{24} internal pair creation 2028
    - Mo$^{93, 99}$ 2973, 8169
    - Po 6439
    - Pu^{239} 3742, 7240
    - Ra and daughter products 8943
    - RaC′ γ-lines, no fine structure 2015
    - RaD conversion and Auger electrons 9679
    - Sb^{124} 590
    - Sc$^{44, 46}$ 584, 596
    - Se^{77m} 6441
    - Sn^{119m} 2-step transition 8919
    - Sr^{87m} 2960
    - Ta^{182m} 8952
    - Tc$^{95, 99}$ 2973, 3720
    - Te^{125}, 35-keV 2984
    - ThD, $H\rho$ of int. conv. electrons 7227
    - UX$_1$ and UX$_2$ 2966
    - Xe$^{131, 133, 135}$ 1276, 2000, 8174
    - Y^{87} 2960
    - Zn^{65} 2018
    - Zr^{89} 5715, 8924
  - **scattering**
    - Co^{60}, diffusion in water 1290
    - hard components 1293
    - 0·41 MeV, Rayleigh scattering 1294
    - multiple, on plane slab 2025
    - back-scattering from thick slab 2026
    - spherical symmetry problems 2027
- **Gamma-rays**—*contd.*
  - **scattering**—*contd.*
    - by nucleons, theory 2988
    - Compton scattering energy and momentum conservation 2989
    - resonant, by Hg^{198} 2990
    - formulation in various materials 3746
    - high-energy, diffusion through matter 4672–3
    - diffusion eq. solution, refinement 7241
    - G.M. counter coincidences from single γ-photons 8949
- **Gas analysis** see *Chemical analysis*
- **Gas discharge tubes** see *Counter tubes; Ion sources*
- **Gases, kinetic theory** see *Kinetic theory*
- **Gases, liquefaction** see *Liquefaction, gases*
- **Geiger counters** see *Counter tubes*
- **Gels**
  - silica gel X-ray-diffusion examination 1353
  - adhesives gelation, rheological changes 1380
  - from oppositely charged sols, setting times 1442
  - silica, ageing invest. by adsorbed Ra 2140
  - ultrasonics invest. 2469, 3151–2, 5192, 8262, 9080
  - electron mic. structure exam. 4788
  - Fe silicate, elast. const. det. 8263
  - Zr hydroxide, opt. props. 8309
  - adsorption studies of sintering 9787
- **Geochemistry** see *Earth, composition*
- **Geodesy** see also *Gravity*
  - heliomeridianscope 1574
  - deflexions, from gravity anomalies 1592
  - distance meas., radar appl. 2354
  - dynamical, fundamental relation 3303–4
  - photoelectric observing 3305
  - gravity measurements, uses 3306
  - radar meas., meteorol. corrections 3307
  - ellipsoid, normal section 5055
  - intrinsic, principles 5056
  - co-ordinates and azimuth, transport along geodesic 5057
  - undulations, rel. to disturbing masses 5058
  - numerical matrix calc. systematization 5971
  - figure of the earth 6011
  - Potsdam 24-m interference comparator 6012
  - chain adjustment in radial triangulation 6013
  - solar eclipse contact time meas. 6702
  - standard, interferometric meas. 6896
  - treatise on triangulation 7498
  - matrices calc. appl. to least sq. method 7499
  - electro-optical angle meas. 7577
  - geoid elevations calc., errors 8484
  - gravitational declination 8485
  - 1st-order term of indirect effect 8486
  - gravity anomalies interpretation and indirect effect 8487
- **Geometrical optics** see *Optics, geometrical*
- **Geometry** see also *Transformations, geometric*
  - thermal and gravitational fields, geometries 3318
  - spherical triangles, nomograms 8425
- **Geophysical prospecting**
  - progress survey 3214
  - **electrical**
    - ground resistivity method, theory 3959
    - glacier thickness meas. 3963
    - current as function of depth 9843
  - **electromagnetic**
    - induction pulse method for petroleum 1530
    - field due to finite slab 1531
    - scale-model experiments 8850
    - an e.m. interpretation problem 9187
  - **gravimetric**
    - borehole data 1529
    - gravity interpretation, 2nd deriv. method 3954
    - combined grav. and mag. anomalies analysis 3955
    - local perturbations det. 6011
  - **magnetic**
    - combined grav. and mag. anomalies analysis 3955
    - telluric method, limitations 3958
    - aeromagnetic surveying 6618
  - **radioactive**
    - ionization meas. apparatus 2230
    - igneous rocks age det. 3227
    - portable survey equipment 3592, 4467
    - drill-hole log, neutron, gamma method 6617
    - aerial method 9844

A complete list of the Subject Headings will be found at the end of the Index.

Geophysical prospecting—*contd.*
 seismic
  surface waves dispersion 3956
  variable-velocity refraction 3957
  electromechanical source of waves 5935
  reflection, correction for refraction 9186
Geophysics see also *Earth*; *Oceanography*; *Optical materials*; *Seismology*; *Terrestrial electricity*; *magnetism*; *Vitreous state*
  pole motion, rel. to geophys. phenom. 820
  density dist., rel. to luni-solar gravity var. 1520
  earth's crust, isostatic structure 1521
  solar influence theory 2191
  non-linear partial diff. eq. treatment 3215
  natural radioactivity, consequences 9189
  K radioactivity and related problems 9190
  instability of internally heated sphere 9839
Germanium
  temp./resistivity curve 308
  electron and hole flow theory 1053
  point contacts, rel. to hole concentration 1058
  diodes, reverse current 1836
  rectifiers 2685, 5410
  alpha-particle-induced conductivity changes 2687
  resistance, pressure dependence 2688
  low-temp. Hall effect, probable mechanism 3519
  electron mobilities, high fields 3520*
  n-type, point contact inverse voltage characteristic 3521-2
  elec. props., effect of heat treatment 3523
  rectifiers, electron-bombardment-induced conductivity 4378
  n-type, hole diff. meas. 4379
  p–n junction, theory and expt. 4380
  injected holes and electrons mobility 4381
  rectifiers, contact-point comp. 4382
  single-crystals containing p–n junctions, growth 4385
  p–n rectifier and photo-cell 5417
  X-ray abs. coeff., K fine structure 5451
  amorphous, X-ray and electron diff. exam. 5820
  Si–Ge achromatic doublet 6827
  p–n junction transistors 6965
  transistors, electric forming 6966
  surface thermoelectric effects 6968
  effect of neutrons on elec. properties 6969
  photoconductivity, charac. 6972
  semiconductor theory 7858
  irradiation effect on semiconductivity 7860
  elec. charac. and anomalies 7862
  thin films, elec. props. 7873
  I.v. optical props. 7882
  work function 7883
  engineering and chemical aspects 7891
  Zener current in p–n junctions 7897
  magneto-res. effect, oriented crystals 7910
  semicond., energy gap temp. dependence 8083
  p–n junctions resistance, press. and temp. effects 9477
  transistors (book rev.) 9478
Germanium hydride
  electron bombardment decomposition 3597
Glaciers
  electrical investigations 3963
  flow as plasticity problem 7401
Glass
  optical, homogeneity defects study 244
  thermal transformation rel. to internal stress 269
  quenching stresses, interferometric det. 667
  optical, elastic and photo-elastic properties 669
  breaking strength, rate-process theory 683
  temp.-viscosity rel., rate-process theory 684
  crack propagation 685, 3103*
  optical, spectral transmission 762
  plate, structural birefringence 995
  dielectric losses, rel. to composition 1044
  "grinding hardness" 1381
  fracture, mechanism 1382
  near-i.r. energy absorption 1761
  liquid He film transfer 1804
  surface polish, phase-contrast invest. 2595*
  glass wool permeability 3065
  Na_2O–PbO–SiO_2 electrode function, hygroscopicity and chem. durability 3142
  Pb–silicate, conductivity after H treatment 3528
Glass—*contd.*
  electrodes, temp. effect on resistance 3863
  refract. index temp.-dependence fluctuations 4231
  diel. const. and loss-angle 4370
  magneto-optical effects 4561
  use in lab. and chem. industry 4877
  Pb glasses elec. conductivity 6212
  annealing, reaction rate theory 6488
  alkali ions diffusion through surface layer 6492
  relaxation spectrum 6804
  sapphire-glass seal, i.r. photocells appl. 6910
  sapphire-glass seal, h.f. induction method 6911
  dielectric losses and breakdown 6952
  secondary emission 7018
  butt seals, stresses theory 7325
  dark, transmittance meas. 7656
  heated, as dielectric 7831
  spicular fracture invest. 8274
  u.v. absorption spectra and reflectivity 8637
  Raman spectra, 4 types 8653
  electric breakdown, conductivity 8760
  glasses, molar refractivity 9100
  light absorption due to valency states interaction 9370
  transparent to X-rays 9887
Glass-metal seals
  Ni–Cr–Fe 772
  optimum annealing schedule 1552
  shape, atmosphere and thermal shocks influence 3101
  metals and alloys expansion characteristics, appl. 3480
  suitable alloys, development 3827
  in end-window G.M. counters 4466
  simple screw-up type 6785
Glycerine
  dielectric relaxation 1819
Gold
  film formation, electron microscope study 1349
  films, contam. by W oxides 3070
  elec. resist. at low temp. 3531
  evap., lattice distortion spectrum 4783
  wire, deformation at high temp. 4807
  low-temp., min. resistance 5418
  etched films, electron diff. pattern anomalies 5822
  v. thin films crystallization 5901
  Poisson's ratio from elect. meas. 7319
  annealing powders without sintering 7440
  abs. energy loss of 18 MeV protons 7956
  thin films crystallization, substrate influence 8339
  effect of deformation on elec. resistivity 9496
Gramophones see *Sound reproduction*
Granular structure
  growing particles, interference 655
  metals, and stress-strain curves 665
  steel, grain size effect 675
  rel. to creep 688, 6515
  Al and Al–Zn, melting 1351
  Al, rel. to density variation 1375
  metals, crystal boundaries 2077
  grain boundaries and pore distrib. in sintering 2078
  Cu diffusion along Ni grain boundaries 2081
  deformed metallic grain 2100
  annealing twins formation 2189
  spheroidization of metallic particles 3058
  natural width of grain boundary 3061
  control during induction hardening 3074
  metal electrodeposits on Zn 3078
  metals, rapid heating and cooling effect 3102
  "block structure" of metals 3676
  Ge rectifiers, electron bombardment technique 4378
  D_0 theory for atomic diff., metals 4773
  Cu, interfacial free energy 4776
  Cu, noncoherent twin boundaries 4777
  grain-boundary diffusion in metals 5813
  Ag grain-boundary diffusion 5815
  boundary micro-flow in metals 5839
  NiFe alloys 5904
  effect of plastic deform., surface-active media 6511
  grain boundary motion theory 7303
  Se, effect on elec. props. 7879
  precipitation of C and N in cold-worked α–Fe 8246
  X-ray microbeam exploration of crystals 8348
  metals, inter-grain matter 9011
  steel, deformation and ageing theory 9750

A complete list of the Subject Headings will be found at the end of the Index.

Graphite
de Haas–van Alphen effect 1176
symmetry, X-ray diffraction study 1498
X-ray and neutron diffraction 3208
electron diffraction study 3806
K and Br cpds., metallic props. 3879
orthorhombic and rhombohedral, possible identity 4899
electrical and thermal conductivities 5350
mech. props., high-temp. 5833
oxide soot, electron microscope exam. 6497
bisulphate electronic structure 7301
surface films effect on friction 9038
thermal expansion 9418
crystallite growth in carbon 9814
Graphs see also *Nomograms*
particle size distrib. analysis 1338, 3060
conductimetric titration, rectified r.f., distortion 1467
electronic graph plotter 3261
forced vibration system soln. 4032
log *ft* calc. for β-transitions 4664
anisotropic drafting device 4998
instr. for slope meas. 5001
thermally variable systems study 5345
method for single-degree vibration problems 7624
physical characteristics det. by curve anal. 8435
Gravitation see also *Relativity*
complex tensor calculus 1
quantization of Einstein's field equations 72
gravitational energy of e.m. field 829
gravitational self-energy of light 1600
Birkhoff's field, interactions with e.m. and pair fields 1610
unified attractive forces theory 1626
cosmic rays origin theory 1906
Newtonian, applicability 2311
rel. to magnetism, kinematical relativity 3314
unified field theory, geometric model 3315
geometries of thermal and gravitational field 3318
radiation friction 3350
generalized theory, Bianchi identities 4075*
extended theory 4076
elements abundance distrib. effects 5011
gravitational potential of galaxy 6000
disk rotating in Galilean system 6017
non-symmetric generalization 6019
potl. derivs. discontinuity at density discontinuity-surface 6047
slowing-down effect on time 6721
gravitational eq. of motion and radiation 6722
action as space coordinate 6724
gravitational waves 6725
gravitational transverse-transverse waves 6726
grav. accel. of neutrons 7299
mutual action with e.m. field 7505
whirl theory 7507
Einstein's theory, 2-body problem 7574
particle motion in field 7649
unstable systems of *n* bodies 8436
rel. to mag. mom., heavenly bodies 8437
meson as least neutral gravitating mass 8442
probability dist., stellar systems 8463
eq. of motion of spinning "test-particle" 9259–60
Gravity see also *Geophysical prospecting, gravimetric*
isotope separation due to, in atmosphere 1259
luni-solar variation 1520
isostatic structure of earth's const. 1521
borehole data 1529
anomalies, deflexion calc. 1592
fundamental relation, dynamical geodesy 3303–4
measurements, geodetic appl. 3306
geoidal undulations 5058
gravitational declination 8485
1st-order term of indirect effect 8486
anomalies interpretation and indirect effect 8487
regional correction of data 8488
pendulum meas., elasticity corrections 9252
Gyromagnetic effect
stable nuclei, gyromag. ratio 1967
in discharge, radioelectric emission 2719
ferromag. elements and alloys 4524
new theory of earth's field 4912
Gyromagnetic effect—*contd.*
Fe gyromag. ratio meas. 5587
invest. with classical resonance method 6353
gyromag. ratios in Fe group ferromagnetics 7073
microwave resonance absorpt. det. in Ni ferrite 8026
magnetite single crystal 8027
electron gyromagnetic ratio 8145
electron anomalous spin gyromag. ratio 8146
Gyroscopes
suspension strips 5135
Fleuriais, motion study 7573
Hafnium
Zr–Hf mixtures, spectrochem. analysis 2152
allotropic transformation 9423
Hall effect
Ge, low-temp. 310
semiconductors 311, 3527, 5406, 7872, 7877
across inhomogeneous conductor 1209
Sb thin films 1827
metallic film, effect of mag. field 1853
MnBi alloy, low temps. 1925
in ferromagnetics 1955, 5622, 6320
in Se single crystal 2875, 6975, 7878
Bi layers 3516
grey tin 3524–5, 7869
Ti single crystals 3526
In, rel. to field, low temp. 3672
magnetite 4526
new meas. method 4564
Te single crystals 4566
Bi, rel. to Corbino effect 5621
in pure Te film 6218
Hall–Kikoin effect, dynamo steel, strong fields 6369
Hall const. for CdO 6370
electron mobility in AgCl 6959
ZnO semiconductor 6963, 7867
graphite bisulphate 7301
(La, Sr) MnO_3 7866
Pb sulphide and telluride, temp. dependence 7870
micro-cryst. Se with I impurities 7879
precision measurement 8077
α Fe_2O_3 with Ti 8736
theory 8865
Na_xWO_3 coeff. 9463
HgSe/Se solid soln. 9468
natural PbS 9470
in noble metals, rel. to atomic no. 9623
Hardness see also *Abrasion*; *Work hardening*
metals, and crystalline interaction 664
glass, "grinding hardness" 1381
single crystal microhardness rel. to indenter orientation 2111
control during induction hardening 3074
6 metals, 4°–600°K 3107
micro-testing, electron-microscope appl. 3805
micro-indentation tester 3832
optical cryst. matls. 4229
rel. to comp., alloys 4806
microhardness testing, damaged impressions 5840
automatic Bergsman-type tester 5841
plasticine 6518
Harmonic analysis see *Acoustic analysis*; *Calculating apparatus*; *Fourier analysis*
Hearing see also *Ear*
audibility of mistuned intervals 159
audiometer calibration 1688
commercial audiometers, performance 1689
communication pathology 1695
earphone response, loudness balance methods 1704
auditory system, neurophysiology 2240
hydrodynamics of cochlea 2256
binaural localization and marking 2257
noise excitation pattern effect on pitch 2258
perception of clicks 2259
ear damping constant meas. 2260
cochlea acoustical action theory 2261
information transmission system 2478
task-oriented group communication patterns 2480
information theory conference 2482
pure tone freq. differential thresholds 3414
v. Bekesy's theory, electroacoustic synthesis appl. 3417
sensitivity meas., watch as sound source 4011

Hearing—*contd.*
acoustics textbook 4180
pitch/frequency rel. 4204
"residue," new interpretation 4205
acoustic filters as ear plugs 4207
audibility threshold rel. to altitude 4970
cochlea electroanatomy 4971
masking error in aural harmonics meas. 5214
loudness calc. and meas. 5219
audiofreq. excitation of skin nerves 5953
place and freq. principles, rel. importance 5954
place mechanisms in freq. analysis 5955
adaptation rel. to loudness recruitment 5956
upper freq. limit 6661
pitch perception, duplex theory 6662
dissonance, physiological origin 6663
binaural functions of summation and localization 7430
interaural time-deviation 7431
information and human ear 7432
nature of ear's nonlinearity 8394
freq. selectivity det. 8395
electric excitation theory 8396
directivity, wave-prop. correl. function theory 9343
Hearing aids
2 modern types 5215
strain-gauge type artificial mastoid 5216
acoustic transducers 6808
test measurements 8603
Heat see also *Radiation, heat*; *Thermodynamics*
theory, and many particle problem 8870
Heat capacity see also *Specific heat*; *Thermodynamic properties*
wind-tunnel and jet-engine gases 252
benzene, low temps. 978
adsorbed films det. 1024
$ZnSO_4 . 7H_2O$ and $. 6H_2O$ 2646
A and N, rotational lags and shock front thicknesses 4184
solids, calorimeters for meas. 4348
binary solid solns., configurational contrib. 5627
adsorbed argon layers 9091
Heat conduction see also *Conductivity, thermal*; *Heat insulation*; *Heat transfer*
with moving boundary 125
solid, power law of surface transfer 250
vaporization velocity invest. 255
in superconductive alloys 326
segment of cylinder 1009
laminated spherical and cylindrical bodies 1011
fluctuating flow, theory 1791
variable-emissivity problem 1792
non-homog. boundary condition equations 2596
transient, air-flow analogy method 2601
in polyatomic gases 2602
flux dist. in composite systems 2603
anomalous, in superconductors 2705
Cu foil in cork, analogy to diffusion in solids 3063
in liquids, recent theory 3384
envelope type tests, theory 3478, 6163
radially symmetrical phase growth control 3905
liquids, distrib. function in phase space 4148
thermally variable systems, graphical study 5345, 7799
Stefan-like problems 5346, 9415
through infinite 2-layer wall 5347
a heat flow problem 5348
temp. dist. problem 5349
gas mixtures 5351
fluid mappers 6056
unsteady heat flow, relaxation methods 6918
in simple metals, eq. 6919
radial heat flow calc. 7800
in rarefied gases, vacuum gauges 8679–80
solids, electron theory, review 8872
solution of equation 9413
asymmetric, in copper/copper-oxide rectifiers 9474
Heat insulation
diffusivity det., poor conductors 1795
diffusivity det., variable-state method 2597
Heat measurement see *Calorimetry*
Heat of adsorption
adsorbed films det. 1024
Cu oxide films, catalysis invest. 1413
Heat of adsorption—*contd.*
chemisorption heat calc. 1415
det., using metal films 1449
CO_2 on reduced Ni 1451
impurity centres, rel. to catalyst efficiency 2123
variation in catalytic reactions 2125–6
calc. from single isotherm. 3160
N on Cu single crystal, anisotropy 3166
crystals, differential due to heat of disorder 3197
CO, N, A and O on CsI 3872
alkali metals, ions and atoms, oscillographic det. 3878
Heat of combustion
alpha-methylstyrene 3882
TiN, TiC 7825
C_2N_2, and formation 7826
Heat of dissociation
C_2N_2, HCN, CClN 1135
CO 2644
N_2 2645
N, in bond energies est. 4869
S vapour 5855
N_2O, interpret. of data 6522
gaseous diatomic oxides stability 7328
F 7827
Heat of fusion
in He liquid-solid transformation 266
ortho-deuterium 3485
calorimeters for det. 4348
hole theory calc. 5370
metals, rel. to atom vibrations, solid state 5632
adsorbed argon 9091
Heat of reaction
of hydration, rel. to ionic radii 1254
BaO formation 1387
nitromethane thermal decomposition 1394
chemisorption heat calc. 1415
formation, chem. compds. and alloys 1866
heat of formation, solid solutions 5633–7
heat of interaction principle 5846
formation heat correl. by ionic potentials 6521
radicals heat of formation 6548
new balanced-pair calorimeter 7824
manganous ion oxidation, Mn potentials 8281
Heat of solution
and transition, $ZnSO_4 . 7H_2O$ and $. 6H_2O$ 2646
Heat of sublimation
C, in bond energies est. 4869
H, D, T 5353
and correlation energy, Li 5629–30
C, from electron impact data 6934
transition metals, temp. var. 7069
Heat of vaporization
H, at b.p. 256
liquid He^3 1805
titanium 3484
ortho-deuterium 3485
hydrocarbons and fluorocarbons 3486
K ions from W, oscillographic det. 3878
H, D, T 5353
Heat of wetting
cellulose, rel. to temp. 3153
Heat radiation see *Radiation, heat*
Heat transfer see also *Convection*; *Heat conduction*; *Radiation, heat*
with moving boundary 125
hot-wire anemometer theory 140
turbulent flow between asymmetric wall temps. 253
Bose–Einstein gas model 263
flux dist. in composite systems 2603
ionized fluids, thermo-mech. 4355
thermal interaction principle 5846
unsteady flow, relaxation appl. 6918
in solids with temp.-dependent props. 7801
solid/boiling liquid, study 7805
simultaneous heat and mass transfer 8573
influence on temp. controllers stability 8674–5
aerodynamic heating at high speeds 7613
to turbulently flowing fluid in smooth pipe 8681
in flow between parallel plates 8682
from sphere in flowing medium 8683
aerodynamic, various shapes 9335
radiant, CO absorpt. coeff. det. 9382

A complete list of the Subject Headings will be found at the end of the Index.

- **Heat treatment**
  - annealing, reaction rate theory 6488
  - effect on orientation in Si ferrite 7083
  - Fe–Si alloys in mag. field 7084
  - ferrites, effect on dielectric and magnetic props. at h.f. 7839
  - pulse-annealing for relaxation process study 8272
  - N-martensite, α''–Fe nitride formation 8408
  - effect on gibbsite N and O adsorption 9784–5
- **Heating**
  - high-temp., high-vacuum furnace 258
  - temp.-controlled lab. furnace 3499
  - vac. furnace for single crystals 4878
  - high-freq. electronic torch 6239
- **Height measurement** see *Altimeters*
- **Helium** see also *Liquid helium*
  - zero-pressure thermodynamic properties 275
  - thermodynamic properties 277
  - normal atom, repulsive potential 557
  - sound velocity −78°C to 200°C, rel. to press. 902
  - secondary electron emission from Mo 1319
  - neutron scattering cross-section 1328
  - thermal diffusion meas. 1654
  - Stark effect in strong field 1722
  - molecular and atomic ion mobilities 1891
  - thermal transpiration 2435
  - dielectric properties, microwave meas. 2664
  - He^3 conc. in atmosphere 3232
  - He^3 thermal diffusion concn. app. 3713
  - diffusion in atmosphere 3981
  - light emission accompanying excitation 4482
  - He^3, He^4 binding energies 5124
  - gaseous He^3, viscosity studies 5171
  - properties, review 5360
  - 20-MeV alpha-particle scattering 6268
  - He^3 in sun, invest. 6688
  - heat conduct. and viscosity data 7607
  - pure, prep. method 7818
  - molecules, formation in glow 8623
  - adsorbed, anomalous first layer 9090
  - two states in gaseous phase? 9426
- **Hexane**
  - electrical strength 8756
- **High-pressure effects**
  - research and technique at ∼ 10 000 atm. 1386
  - quartz inversion temp. 3491
  - moulding Rochelle salt for crystal plates 3900
  - extreme press. lubrication 4141
  - melting of methyl siloxanes 4335
  - quantum-theoretical densities 4810
  - metals scabbing 5812
  - compressibility of leather 5843
  - high polymer compressibility 5844
  - on elec. resist. metals and intermetall. compds. 6230
  - compressibility of gases up to 10 000 atmos. 9328–9
  - change of quartz piezo-frequency 9454
  - barrier-layer rectifiers 9473
  - stresses produced by exploding charge 9755
- **High-speed photography** see *Cinematography, high-speed*; *Photography, high-speed*
- **Humidity** see also *Atmosphere, humidity*; *Hygrometers*; *Moisture*
  - simple controlling device 128
  - effect on ultrasonic absorption in air 1676
  - apparatus producing known humidities 3231
  - sensitive v.p. recorder 3969
  - water vapour det. in gases, thermal method 8323
- **Hydrocarbons**
  - mass spectra, temp.-variation 5506
- **Hydrocyanic acid**
  - dielectric permittivity 6199
- **Hydrodynamics** see also *Flow, liquids*; *Jets*; *Liquid oscillations*; *Liquid waves*; *Viscosity*
  - cosmical, review 794
  - nuclear dipole oscillations appl. 1231
  - long-chain molecules in soln. 1437
  - stability of fluid heated below 1642
  - magneto-hydrodynamics, isotropic turbulence 1646, 6774
  - magneto-hydrodynamic waves in ionized gas 1944
  - magneto-hydrodynamic shocks 1945
  - magneto-hydrodynamics, textbook 2309
  - incompressible fluids, least constraint appl. 2411
- **Hydrodynamics**—*contd.*
  - Bernouilli's viscous compressible fluids theorem 2412
  - superposable fluid motions 3360
  - textbook 3361
  - equations of motion 3362
  - stability theory, no solid boundary 3366
  - vel. dist. models, electrolytic tank 3396
  - electromagnetic equations appl. 3647
  - rheological aspect 3831
  - of star and planet structure 4067
  - acoustic absorption in fluids 4192
  - consequences of liquids swarms theory 5157
  - critical flows with density stratification 6057
  - Ertel's vorticity theorem 6058, 8552
  - temp. distrib. near heated cylinder 6165
  - quantum hydrodynamics of He, v. low temp. 6178
  - space and time correl. in homog. turbulence 6771
  - compressible, variable-viscosity fluid, motion rel. to sound waves 7586
  - new vorticity transfer theory 7591
  - Alfvén's magneto-hydrodynamic waves, dispersion eq. 8062
  - two formulations, appl. to liq. He II 8695
  - He^3/He^4 mixtures 8696
  - eq. of motion of incompressible elasto-viscous medium 9034
  - quantum, deriv. from statistical mechanics 9297
  - motion between coaxial cylinders 9298
  - particle size meas. 9738
  - magnetism generation by fluid motion 9842
  - **solid bodies in liquids**
    - sphere entering water, virtual mass 871
    - supersonic missiles entering water, shadowgrams 872
    - sphere in viscous liquid 2418
    - motions in rotating liquid 3371
    - fluid resistance correlating modulus 3372
    - axisymmetric body forms press. distrib. 6773
    - plane moving || to itself 9305
    - flat plate, impulsive 9306
    - movement of granular bed by flow 3370
- **Hydrogen**
  - *P-V-T* properties 126
  - vap. press., b.p. to crit. point 256
  - zero-pressure thermodynamic properties 275
  - ionization in metals 401
  - CO_2/H_2, N_2/H_2 thermal diffusion coeff., pressure dependence 896
  - H_2, HD, D_2 mixtures, ideal solution laws test 878
  - specific ionization curve 1141
  - secondary electron emission from Mo 1319
  - chemisorption on W 1411, 3877
  - tritium estimation 1468
  - from photochemical H_2O dissoc. in atmosphere 1534
  - H–Ti system invest. 2115
  - isotopes adsorption and desorption, tunnel effect 2145
  - thermal transpiration 2435
  - scattering of protons 2758
  - molecule, homopolar bonds 2896
  - atomic, recombination kinetics 3132
  - adsorption on promoted Fe catalyst 3156
  - adsorption on $ZnO–Cr_2O_3$ 3157
  - normal- and para-, ultrasonic absorption 4187
  - isotopes, v.p. and crit. const. 4333
  - H^3 binding energy 5124
  - compressed, spark lags 5445
  - atoms, electron loss in H_2 5503
  - magnetic rotatory powers 5618
  - H_2^+ hybrid bonds 5641
  - H_3 mol. orbital calc. 5648
  - in high-temp. heat engine 6186
  - sparks, cathode oxide layers 6235
  - breakdown, secondary ionization 6241
  - arc, excitation temp. 6246
  - arc, Balmer line width 6247
  - binding energy, cellular method calc. 6374
  - pressure-induced absorption 7174
  - heat conduct. and viscosity data 7607
  - molecular, wave function 8100
  - rate of chemisorption on reduced Cu 8313
  - diel. const., microwave 8717
  - H_2^+ $1s\sigma$–$2p\sigma$ oscillator strength 8877
  - electronic energy calc. 8879
  - molecule, calc. of polarizability 9628

Hydrogen chloride
  diel. props., solid state 6946
Hydrogen cyanide
  dielectric properties, crystal structure 9151
Hydrogen fluoride
  dielectric permittivity 6199
Hydrogen peroxide
  production in irradiated water 2134
  crystal structure; water solid solutions 2176
  magnetic rotatory power and constitution 3689
  photochem. reaction with O_3 5869
  formation in water by ionizing radiations 9775
Hydrometry see *Flowmeters*
Hydrostatics
  magneto-hydrostatic fields 1942
  internal mechanical equilib. theory 4140
  magneto-hydrostatic fields stability 7109
Hygiene see also *Radiation monitoring*; *Radiation protection*
  atmos. electricity meas. in mines 2230
  expired air partitioning app. 4978
Hygrometers
  automatic frost-point, for upper air 2200, 9200
  recirculating apparatus for testing 3231
  wet- and dry-bulb, recording 3969
  thermocouple psychrometer 9199
  elec. conductivity of hygroscopic film 9797
  automatic dew-point 9799
Hysteresis see also *Magnetic hysteresis*
  internal friction in Cu single crystals 1385
  in rubber and GR-S thermal conductivity 2598
  of wetting 3381
  in thixotropic flow 3825
  temporary enhancement in $BaTiO_3$ 4367
  heat treatment effect on gibbsite N and O adsorption 9784–5
Ice see also *Glaciers*; *Snow*
  ice and AgI seeding 4939–40
  artificial precipitation disc. 4942
  precipitation by AgI time-lag 1545
  crystals, H-bond vibration spectra 2561
  particles, light scattering 3235, 3989
  spectroscopic transparency 3964
  ice clouds, marginal refraction 3990
  lattice energy 4571
  in supercooled clouds 4938
  crystal growth 4943
  heavy, absorption of *p* and *d* 5483
  neutron production by cosmic rays 5542
  seeding effectiveness review 5939
  Schaefer–Langmuir seeding technique trials 6641
  sheet, air-coupled flexural waves 6793
  AgI nuclei photolytic inactivation 7350
  ice-sheets flow as plasticity problem 7401
  formation in clouds, review 7417
  charge of rime layers 9861
Illumination see also *Brightness*
  coupled enclosures 172
  colour-rendering invest. 1790, 6157
  photographic darkrooms 2270
  fluorescent luminaires, dist. and calc. 2495
  slide rule for calculations 4222
  comfortable brightness relationships 4965
  effect on gloss meas. 6142
  of graticule, efficient 6906
  candlepower standards horizontal dist. var. 7654
Impact see also *Ballistics*
  plastic deformation propagation in solids 680
  elastic cables 3349
  fragment velocity after penetration 3352
  flash at high-speed water entry 3353
  penetration by high-velocity jets 5138–9
  longitudinal on bar, vibration 9340
Indeterminacy
  proof from commutation laws, generalization 858–9
  general formulation 2395
  of absolute repose, wave mech. 4107
  4th uncertainty relation 7557
Indium
  atomic heat, liquid He temp. 1021
  foils, use in neutron flux meas. 1326
  thermal conductivity at liq. He temps. 1794
  de Haas–van Alphen effect 3624, 9601
Indium—*contd.*
  Hall and magnetoresistance effects, low temp. 3672
  photoconductivity, charac. 6972
  superconducting, mag. field penetration 7909
Inflammability see *Combustion*
Infra-red spectra see *Spectra*
Instruments see also *Laboratory apparatus*; *Measurement*; *Recording*; *Scales, instrument*; and under specific subjects, e.g. *Astronomical instruments*
  parallel and rectilinear spring movements 2400
  ultrasonic soldering irons 2477
  ballistic galvo., impulse difference 2817
  atomic energy instrumentation 3592
  nuclear physics, French work, review 3595
  American exptl. methods, recent trends 8489
Integral equations
  Fredholm type solution, iteration method 2292
  relaxation oscillations, amplitude bounds 3404
  elastic body deformation vector 3813
  between distrib. functions of molecules 5643
Integrals see also *Calculus*
  stellar structure perturbation, variational solution 818
  tables for plane loop magnetic field calc. 484
  Mellin transform appl. 1561
  steepest-descent method in e.m. diffraction theory 1943
  tabulated definite integrals 3250
  in molec. struct. theory 3252
  antisymmetric function integrals 4996
  saddle point method 8423
  linear recurrent relations of series coefficients 8424
  double integral evaluation theorem 9339
  Weyl's, extension to arbitrary shapes 9613
Intensity measurement
 acoustics
  radiation pressure theory 164
  best beats method, accuracy 4210–11
  aural harmonics, masking error 5214
  ultrasonic, l.f. modulation method 6814
Interface tension see *Surface tension*
Interference
 light see also *Optical films*
  phase shift by films, meas. 228
  reciprocal diffraction effect 231
  appl. of minimum-ray concept 232
  labradorite iridescence 733
  light interference and beats identity 990
  parallel Nicols, colour sensitivity 994
  phase change, on reflection from films 1762
  superposition principle limitations 1765
  3-point alignment appl. 2500, 4225
  thin films in i.r. 2576
  Fresnel, in Michelson interferometer 2577
  filters for specified wavelengths 3464
  phase contrast microscopy theory 4320
  calcite refr. index det. 5236
  phase change at mica–Ag interface 5309
  phase change study, reflection at Ag 5312
  multiple layers, light dist. functions 5318
  sensitive colour rel. to colour temp., crystals 5336
  new interference microscopy method 5342
  interference microscope, transmission and reflection 6159
  superposition principle, limitations 6796
  filter for solar study 7454
  interference filter phase plate appl. 7779
  of beams emerging from Lummer–Gehrke interferom. 8658
  $KClO_3$ crystal colours 9409
Interference fringes
  Twyman, applications 230
  Fizeau, optical flats testing appl. 992
  in density var. meas. 3470–1
  transmission-like, multiple-beam, reflection 4305, 6080, 6895, 8660, 9396
  thin layers on glass, colorimetry 4306
  absolute phase change, absorbing media 5310
  Mach–Zehnder, effect of size and purity of source 6145
  wavelength calibration in i.r. 6898
  phase contrast, gradual phase var. study 6916

A complete list of the Subject Headings will be found at the end of the Index.

Interference fringes—*contd.*
 metal film interferometers, fringes shape 7781
 due to Soleil compensator 8659
 light "beats" 9395
Interferometers
 acoustic waves
  hot-wire, ultrasonic, vapours appl. 4193
  for sound transmitters 4214
 light
  Twyman–Green, appl. 230
  Michelson, adjustment 1766
  Michelson, Fresnel interference 2577
  Mach–Zehnder, effect of size and purity of source 2578, 6145
  TiO$_2$ as beam divider 2579
  multiple-beam, complex thin films appl. 4307
  Fabry–Perot, compound 5319
  phase change dispersion corr. 6143
  cinematographic, recording, in chem. reaction invest. 6834
  metal-film coated, fringes shape 7781
  Lummer–Gehrke, interference of emerging beams 8658
  banded spectrum, for thin films 8661
  meas. of liquid diffusion 9397
Interferometry
 acoustic waves
  ultrasonic interferometry, gases 905
  satellite resonances 906
  ultrasonic vel. meas. improved methods 4182
  SF$_6$ ultrasound vel. and absorption det. 4183
  ultrasonic, thermistors appl. 6084
 electromagnetic waves
  Michelson at mm wavelengths 1208
  metal grid interference filter 7118
 light
  differential phase change meas. 226
  multiple-beam, phase change det. 227
  film phase shift, meas. 228
  Ag films, optical props. invest. 229, 1763, 5316–17
  minimum-ray concept, appl. 232
  quenching stresses det. 667
  conical flow test 890
  multiple-beam, review 991
  diffusion studies, high polymers 1651
  diffusion studies, cellulose acetate 1652
  film thickness meas. 1767, 6144, 6897
  film phase-shift amplification 1768, 2580
  interferometer microscope 1785
  film thickness and refractive index meas. 2575
  obs. of vibrating plates 3407, 4305, 6080, 6895, 8660, 9396
  density variations meas. 3470–1
  microscopic spheres meas. 4126
  angle meas. 4130
  h.f. sound press. meas. 4212
  white-light, phase changes effect 4308
  diffraction boundary effect expt. 4311
  interferometer microscope 4319
  gaseous systems diffusion coeffs. det. 5165
  mica–Ag interface, phase change 5309
  absolute phases meas. in absorbing media 5310
  absorbing layers study, phase-change method 5311
  Ag–glass and Ag–air reflections invest. 5312
  microscope, review 5342
  cleavage faces of NaCl 5906
  24 m geodetic comparator 6012
  electrodeposited film exam. 6146
  refractive index in conc. gradients 6831
  stratified solutions refract. index meas. 6832
  refractive index in conc. gradients, optical differentiation 6833
  partial coherence concept appl. 7782
  two length meas. techniques 6896
  wavelength calibration in i.r. 6898
  "Commensurator" for screw calibration 7576
  new techniques, review 7780
  Young's modulus det., Ni–Cu alloys 8261
  piezo-elec. cryst. vibration amplitude meas. 8590
  Hg^{198} length-standards comparisons 9363
  sedimentation constants det. by Fresnel diffraction 9782
Internal conversion see *Gamma-rays, internal conversion*
Internal friction see *Elastic losses*
Internal stresses see *Stresses, internal*
Interpolation
  functions tabulated at irreg. intervals 3256
Interstellar matter
  radiation-absorbing centre 22
  growth of stars by accretion 58
  magnetic fields and cosmic radiation origin 416
  clouds, expansion, collision and composition 794
  dust grains, acceleration by supernovae 795
  gas-cloud expansion 2314–15
  dust-cloud gravitational condensation 2317
  properties of clouds preceding planet formation 2318
  Doppler broadening by turbulence and interstellar clouds 2319
  nebular red-shift hypothesis 2320
  Milky Way brightness fluctuations 2344–5
  abundance of potassium 2931
  turbulence, eddies 3270
  ionosphere fluctuations hypothesis 3271
  effect on stellar statistics 3287
  λ4430 band intensities 3293
  large clouds, abundance 4043
  recent work, review 4044
  absorption near sun 5012
  Pleiades nebula light deviation 5038
  effect of galaxies collisions 5043
  star-light polarization expts. 5984
  distrib., collision probabilities with planets 6681
  molecules density, interstellar space 6682
  continuous absorption 8443
Iodine
  zero-pressure thermodynamic properties 275
  solubility in solvent mixtures 2429
Ion beams see also *Mass spectrometers*; *Particle accelerators*
  interaction with plasma 377
  oscillations in F-M cyclotron 1117
  C^{12} and C^{13}, cyclotron-accelerated 1870
  canal-ray polarization processes 2761
  charge exchange with atoms 3577
  C, bombardment of U → Cf isotopes 3762
  $+^{ve}$ ions detect., magnetic electron multipliers 4394
  current integrator 4444, 7958
  slightly deviated, trajectories 7006
  rotating Li target 7022
  radiowave generation 7112
  multiple traversal of cyclotron targets 7946, 9532–3
  synchrotron beams light, spectral dist. 9539
 focusing see also *Alpha-ray spectrometers*
  electrolytic tank study 1112
  mass spectrometer sources 1113, 1874, 8791
  transverse convergence due to slits 1114
  perfect velocity focusing 1873
  direction double focusing 2739
  source exit slit suppression 2757
  aberrations in ion sources 3579
  in particle accelerators, theory 5472
  mag. spectrographs, fringing field effects 5479
  aperture defect with arbitrarily bounded field 7947
  mass spectrometer ion optics 7948, 4449
  cyclotron, internal scattered beam 8181
Ion counters see *Counters*
Ion sources see also *Thermionic emission*
  combined graphite furnace and mass spectrometer 1111
  for mass spectrometry, electrolytic tank study 1112
  mass spectrometer, ion optics 1113, 1874
  for neutron generator 1320–1
  of alkali metal ions 1897
  exit slit suppression 2757
  ion lens aberrations 3579
  for mass spectrometer current regulator 4448
  magnetic, Heil-type 4458
  for S^{32} mass det. 4618
  mass spectrometer, for high press. 5484
  low-voltage arc type 6272
  design problems 7949
  high-intensity, new principle 7959
  improved type, electrostatic focusing 8791
  math. data for electron drain 9523
  review, bibl. 9535
  for mass spectrom. leak detector 9540
  for electrostatic generator, photoelectric control 9555

Ion velocity
  Na^+ atuo-diffusion coeff. 3062
  Langevin's analyser 6288
  meas. by μsec discharges 6991
  in strong field, statistical theory 7044
 electrolytic see also *Conductivity, electrolytic*; *Electrophoresis*
  anomalous, D^+ and OD^- in heavy water 3138
  Li picrate in water-ethanol mixt., rel. to solvation 3139
  self-diffusion, Onsager theory 3857
  in cation exchange resin, radio tracer technique 7347
  Ilkovic eq. diffusion term test 9111
  H overvoltage and double layer 9065
  ionography, migration rate relationships 9105
  mobility/temp. discontinuities, supercooled ionic melts 9323
Ionization see also *Dissociation*
  O^-, by electron impact 403
  work per ion pair for α-particles 1140
  by alpha-decay recoil particles 1143
  atoms, electron impact 1890
  high-energy particle tracks, structure 2030
  by fission fragments 2059, 7285
  by magnetic monopole along path, theory 2064
  cosmic-ray particles 2782
  cascade theory 2794
  340-MeV protons energy loss for ion-pair production 4456
  yields of heavy particles 4485
  by metastable atom pairs collision 5504
  Gray's theory, correction factor 6287
  Ca, Li, Al, thermal, specific charge det. 7982–4
  photo-ionization cross-section, B to Ne 8143
  ditto, alkali metal 8144
  effects of ionization density var. in radiation chem. 9071
 gases
  Joshi effect explanation 341
  l.p. discharge, de-ionization processes 346
  in l.p., h.f., electrodeless discharge 347
  plasma oscillations 352
  H first Townsend coeff. 402
  at high intensities, meas. 404
  Hg vapours in gas mixtures, flashing discharge 1080
  ($^3P_2$) Hg atoms role in Hg rare gas discharge 1081
  H and D specific ionization curves 1141
  air, by quinine sulphate hydration 3463
  mass spectra, mono-D paraffins 4483
  ditto, propanes and butanes containing C^{13} 4484
  H atoms, passing through H_2 5503
  deuteromethanes, mass spectra 5505
  hydrocarbons, temp. var. of mass spectra 5506
  ion/atom collisions, He, Ne and A, cross-sections 5507
  excited and ionized gases in equilib., entropy 6189
  secondary, H breakdown 6241
  Hg vapour de-ionization in strong field 6289
  Chapman Enskog method convergence 6790
  observation by μsec discharges 6991
  lateral distrib. of ions across track 7043
  chemical, in flames 7335
  A atoms by He or Ne metastable atoms 7980
  average excitation pot., air 8805
  alkali and alk. earth halides vap. disch., −ve ions 8806
  at encounter of shock-waves 9347
  ion density meas. by +ve ion collection 9560
  effect on reaction rates 9760
 liquids
  liquid SO_2 3854
 solids
  H in metals 401
  processes in porous insulators 1142
  charged particles in emulsions, relativistic increase 2278
  crystals photoconductivity and luminescence, mech. 6136
  average excitation pot., Al 8805
  electrons, in photo emulsions 8779
  LiH, state of ionization 9833
Ionization, atmosphere see also *Ionosphere*
  small-ion density variation 764
Ionization, atmosphere—*contd.*
  ionized current, effect on earth's field 1527
  E-layer variation, det. 1537
  large-ion variations in disturbed conditions 2228
  ion-density rel. to soil emanation 2229
  in mines, meas. 2230
  ionizing efficiency of meteors 2324
  effect of scale height gradient 3978
  ionosphere, electron collision frequency 4923
  lower atmos. ion balance, review 4951
  meteoric, radar invest. 4952
  small ions mobility 4953
  free air radioactivity invest. 5941–3
  heavy ions conc. variation 6633
Ionization, surface see also *Thermionic emission*
  contact noise in semi-conductors 314
  Ba film, photo-ionization 1119
  alkali metals, as ion source 1897
  dielectrics, Lichtenberg figures 6998
Ionization chambers
  graphite coating electrodes 386
  pulse shape 387
  high-pressure, applications 388
  recombination calc. 404
  particle and radiation detectors, review 1123, 4464–5
  multiple-detecting-layer neutron counter 1333
  cavity, for absorbed X-ray energy meas. 1880
  large coaxial type, for cosmic-ray study 1881
  insulators for pocket instruments 1882
  students α-particle counter 3586
  quartz-fibre electrometer appl. 3592
  progress in France 3595
  compared with G.M. counters for γ-ray meas. 3751
  use in bent-crystal technique 4419
  cloud-ionization chamber for cosmic-ray interactions 4469
  integrating X-ray dosemeter 5453
  small, using BF_3 construction and appl. 5492
  without guard-ring, meas. error calc. 5493
  statistical errors theory appl. 5494
  high-alt. bursts meas. 5545
  radon meas. device 5686
  differential, for α-rays 6436
  BF_3 for neutron meas. 7030
  for electron dosimetry 7031
  d.c. amplifier for portable type 7040
  survey-meter for soft betas in air 7968
  direct reading radiation monitor 8155
  X-ray half-value-layer meter 8765
  for Ra standardization 8911
  portable, with logarithmic response 9549
Ionization gauges see *Vacuum gauges*
Ionization potential
  Th III, provisional value 180
  in h.p. Hg. discharges 355
  C_2N_2, HCN, CClN 1135
  CH_4, CH_3OH and $CH_2(OCH_3)_2$ in dissociation processes 1139
  cis- and *trans*-1, 3-butadiene, calc. 1215
  iso-electronic row computations 1250
  Ritz correction estimation 1251
  Li ground state calc. 1985
  1 : 1-dichloroethylene 3447
  calc., molecular orbital method 3685
  SF_6 4284
  C atom electron affinity 6393
  Cu, calc. from third spectrum 6842
  rel. to force constant 7157*
  empirical relations 8905
  HCl, H_2S 9514
  mass spectrograph meas. 9559
Ionosphere see also *Electromagnetic wave propagation, ionosphere*
  random fading records 766
  and lunar echoes Doppler shift 801
  upper atmospheric nomenclature 1535, 2201, 3973–4
  world-wide F_2 ionization 1536
  E-layer ionization variation det. 1537
  F_2-layer, equator position 2202
  Kiruna research (1948–9) 2203
  corpuscular influences review 2204

A complete list of the Subject Headings will be found at the end of the Index.

Ionosphere—*contd.*
F-region recombination in 1947 eclipse 2205
lowest layers, theories 2206
ionization-density dist. 2870
irregularities, effects on radiowaves 2873
magnetic storms and ionospheric currents 3223
short-wave signals, periodic fading 3241
effect on radiowaves from discrete sources in galaxy 3271
tidal effects 3976
F_2-layer ionization zoning 3977
effect of scale height gradient 3978
thermal sepn. of layers 3980
sporadic *E* movements 4920, 6628–9
D- and F_2-layers, 21 Mc/s echoes 4921
sky-waves spreading invest. 4922
irregular ionization 4923
rel. to night sky light lat. effect 4950
rapid changes invest. 5937
*F*2-layer variations in solar eclipse 6626
*F*2-layer critical freq. world dist. 6630
electron annihilation in F_2-layer 6631
"ionospheric bays" and geomagnetic bays 6632
Arctic *E*-layer gyro-freq. 6633
lower, fine structure 6634
E-region fine structure 6635
electron densities det. from *h′*, *f* curves 6636
aurora and twilight spectra study 6647
currents, rocket invest. 7398
*F*2-layer height var. 7406
magnetic storms influence on *F*2 region 7407–8
temperature, review 7409
radiowave reflections, random tilts 8068
currents causing magnetic variations 8370
ions vertical transport by solar tides 8376
sporadic *E*, area and drift 8377
temp. influence on ionized layer formation 8378
electron density rel. to altitude 8379
sky-wave spreading invest. 8380
effect on radiations from Cygnus 8445
solar X-rays and u.v. meas. 9202
electron density rel. to ground press. and magnetic activity 9204
effect of planetary positions 9863

Ionosphere measuring apparatus
automatic reflection height recorder 1538, 2207
polarimeter for l.f. radio echoes 2868
sounding apparatus time-base circuit 3968
radio cross-modulation 3670
review, bibliog. 3965
rapid frequency change 4923
high-speed recording technique 5938
continuous recording technique 6627

Ions see also *Thermionic emission*
pos., production in Cs vapour arc 345
flow stability of electron beams 363
ion accelerators, trajectory analysis 366
ion trapping and electron beam effects 369
pos., constants from gaseous diode invest. 383
ion-neutralized electron beam, sheath formation 1110
fast H_2^+ dissociation energies 1136
mobilities in N_2, rel. to quadrupole moment 1144
neg., corona excitation 1858*
molecular and atomic, He, Ne, A, mobilities 1891
positive-ion emission 1898
alkali and halide, revised diel. parameters 3899
magnetic shielding field 4613
trihalide and bifluoride, bonding 4867
ion/atom collisions, He, Ne and A, cross-sections 5507
neg. ion formation by electron capture, neutral molecules 5874
conc. in H arc 6247
heavy, conc. variation in atmos. 6633
ionic character of bonds 7158
solar coronal, conc. 7470–1
effect in electron avalanches 7917
vertical transport in ionosphere by solar tides 8376
metastables in Townsend discharge 8752
cathode electron emission caused by 8753
plasma oscillations in metals 8851
carbonium, gaseous, reson, energy lack 8882

Ions—*contd.*
diffusivity, dependence on mass and volume 9318
theory of plasma 9561–2
hollow cathode for c.r.t. + ve ion studies 9563

recombination
Ne electron/ion recombination 350
in pulsed radiation beams 404
He afterglows, electron removal mech. 1865
F-region, 1947 eclipse 2205
in He and Ne afterglows 4482
in counter tube discharge 6275
luminosity prod. in pulsed discharges 6992
recombination spectra production 6994
dissociative recombination 7981
He_2 in glow discharge 8623
electron capture by protons in H 9564

Ions, electrolytic see also *Conductivity, electrolytic*; *Dissociation, electrolytic*
anisotropy calc. from depolarization factors 239
ionic conductivity in crystals 735
ionic radii, correl. with hydration heat 1254
elevation of fluidity, and mobility 1425
solvation in liquid mixtures 1426
sorption column ion exchange 1446
hydration, rel. to electrolytic polishing 2127
H^+-ion problem in aq. solns. 2130
Debye effect, ultrasonic study 2476
solvation in liquid mixtures 3139
ionic transport, liquid silicates 4839
polarizabilities in perovskite-type crystals 4901
gegenions effect on light scattering, coll. electrolytes 5331
Fe^{++} and Co^{++}, anomalous mag. moments 5583–4
hydrated cations and solvent, water exchange 5849
polarizabilities and radii in soln. 5861
polarization in water drop, electron suscept. 6192
heat of formation correl. by ionic potentials 6521
association and charge calc. 6529
separation, sharp meniscus, and mobilities det. 6531
ionic currents, quantum statistics appl. 6657
distrib. under charged monolayer 7599
radioactive, exchange between soln. and metal 9041
ion pair contact distances in dichloroethanes 9441
H ion extraction from soln. 9768

Iron
cast-iron flow and fracture 676
contact potential time variation 1032
evaporated films contact potentials in air and N 1033
film, as orientated overgrowth 1350
elastic constants, pulse method 1362
effect of Piobert lines deformation 1486
single crystal thermal e.m.f., magnetization effect 1854
3% Si, permeability anisotropy 1926
reversible susceptibility invest. 1938
tensile properties, low temp. 2105
plastic deformation distrib. under tension 3096
grain size, heating and cooling effect 3102
friction, 4°–600°K strength, hardness 3107, 6519
crystal deformation by abrasion 3190
high-temp. oxidation, nucleation process 3193
elec. conduct. of films, low temp. 3530, 6209
plastic deformation, H segregation effect 3824
film, oxidation meas. 4779
gyromag. ratio meas. 5587
mag. permeability changes under tension in alternating field 7142
α-Fe yield phenomenon and twinning 7321
annealing powders without sintering 7440
evap. film, elec. cond., 7887
precipitation of C and N 8246
single cryst. prep. 8266
low temp. heat conductivity 8678
magneto resistance, low temp. 8866
electrode, potential 9064
magnetic viscosity, temp.-dependence 9607

Iron ammonium alum
low temp. mag. properties 5581

Iron chloride
$FeCl_4^-$ photoreduction in alcohol 3147

Iron oxide
reduction by H, kinetics 2119
hydrous ferric oxide, ion adsorption, mass action appl. 5884

Iron oxide—*contd.*
α Fe_2O_3 magnetic properties 6333, 7077
FeO epitaxial growth by controlled oxidation 8338
α Fe_2O_3 electrical properties 8736
Iron sulphate
ferrous sulphate solns. X- and γ-rays effect 5873
Iron sulphides
mag. and elec. props. 7851
Isomerism see also *Nucleus, energy levels*
rotational, in perfluoro paraffins 2148
1, 2-dihalogenoethanes, rotational 2908
rotational, 1, 2-dibromoethane 3173
methylacenes and methylenedihydroacenes, rel. stabilities 5890
unimerism 7360
substituted stilbenes, spectra 7361
rotational, 2-methyl-butane and 2 : 3-dimethyl butane 7363
rotational, propylene dichloride, energy difference 7364
rotational, in oxalyl chloride 7715
rotational, i.r. spectroscopic studies 7734
rotational, nitrous acid, alkyl nitrites 8638
Isomerization
insulator oxide catalysts 2124
$N^{15}N^{14}O^{16}=N^{14}N^{15}O^{16}$ equilib. calc. 2540
rates for substituted stilbenes 7362
Isotope separation see also *Radiochemistry*
chromatography 729
thermal diffusion ratio, equation 879
S isotopes, in exchange reactions 1026
in atmosphere, by settling 1259
H, adsorption and desorption, tunnel effect 2145
UX, efficiency of methods 2961
A^{36} and A^{38} conc. 3012
chromatographic technology 3155
He^3 thermal diffusion app. 3713
Sb activity enrichment through Szilard–Chalmers effect 3757
radiochlorine, by Szilard–Chalmers effect 3758
NO, intramolec. fractionation 4624
(*n*, γ) recoil method 4625
thermal diffusion theory 4626
low-level radiocarbon 4627
Xe, Kr and Se, enrichment by centrifuge method 5678
gas centrifuge convection processes 5679
in ultracentrifuges with H stabilization 5680
ultracentrifuges, enrichment increase 5681
D from heavy water 5682*
in atmos. below 55 km? 5683
thermal diff., turbulence effect 6780
solutions of He^3 in He^4 6928
I^{132} production 7282
mass spectrometers appl. 7950
artificial radioelements prep., survey 8325
electromagnetic, review 9646
Isotopes
Ba isotope shift 183
odd-even isotope shift staggering 545
Tm isotopic constitution 1258
O and N, effects in NH_4NO_3 decompn. 1396
gas isotopic content, microwave absorption study 1471
length-standard lamps 1720, 8615, 9363
Pb spectral shift, regularities 1971
radioactive C time scale 2193
effect on mass spectra of molecules 2934
natural elements, stability 2937
effect on $CHCl_3$ dissociation prob. 4486
Ag, spectrum shift 4597
H and HT rel. reaction rates with Cl 4834
C and N, line shifts 6109
Al, Si, P and S, masses 6397
C^{12} and C^{13}, relative decarboxylation rates 7342–3
Sn, superconductivity 8742
kinetics of exchange reactions 9043
isotope effect in oxidation of $CH_3C^{14}OOH$ 9048
detection see *Mass spectra*; *Radioactivity*
relative abundances see also *Elements, relative abundances*
mass spectrometer improvements 562
B^{11}/B^{10} 1257
C, N, affected by cosmic ray transmutations 2800

Isotopes—*contd.*
relative abundances—*contd.*
natural radiocarbon, world dist. 2935
complete reference tables 2938, 6402
He^3 in atmosphere 3232
Kr, mass discrimination effect on meas. 3714
I^{127}/I^{129}, earth's age 5696
He^3, in stars, novae and white-dwarfs theory appl. 5996
T in nature 6396
C^{13}/C^{12} meas., by i.r. absorption 7754
natural radioactivity, consequences 9189
Jets see also *Sprays*
standing ripples from obstacles 2415
effect of air entrainment 2416
compressible supersonic flow 2449
contracting-jet surface tension meas. 3163–4
high-velocity, penetration 5138–9
Laval nozzle, thermodynamics and chem. kinetics of flow 6772
eddy filaments, transverse wave propag. 8549
atomization, effect of turbulence 8550
round laminar jet 9301
K-capture see *Radioactivity, electron capture*
Kerr effect see *Double refraction, electric*; *Magneto-optical effects*
Kinematical relativity see *Relativity*
Kinematics
blind navigation theory 59
displacement/time recording, photographic 863
cardinal points existence 8537
relativistic 9261
moment of inertia, student's expt. 9291
Kinetic theory
quantum mech. basis, thermodynam. appl. 6755
gases see also *Association, gases*; *Avogadro's number*; *Brownian movement*; *Diffusion, gases*; *Equations of state*; *Molecules*
relaxation times 897
accommodation coeffs. on Pt, rel. to press. 898
non-polar gases, 3rd virial coeff. 899
Ne–H_2, –D_2 and –He, thermal diffusion invest. 1654
transport of Al atoms 1662
thermal diffusion, critical region 2436
A, Ne, N, O, CO_2 and CH_4, self-diffusion temp. dependence 2455
N compressibility and corresponding states 2456
viscosity/thermal cond. ratios, organic vapours 3391
interrupted i.r. radiation absorption 3402
methane, 2nd virial coeff. and van der Waals force 3403
mixtures, 2nd virial coeff. 4172
square-well molecular potential model 4173
imperfect gases, Born and Green's theory 4174
pressure broadening, statist. theory 4244
condensation phenomena 5133
behaviour in vortex tube 5169
He^3 viscosity 5171
Br and I vapours, visible absorption studies 6125
triple-dipole atom interactions 6376
Chapman Enskog method convergence 6790
applied to ion motion in electric field 7044
thermal diffusion, compressed gases 7605
intermolecular force parameters interpretation 7622
intermolec. force det. from eq. of state 8584
initial value problem in ∞ space 9337
liquids see *Liquids, theory*
Krypton
neutron scattering cross-section 1328
vapour pressure 2435
C_2 (Swan) bands 5257
crystal, triple-dipole interaction 6373
of radioactive origin, search 6399
Kr^{84} interferometer lamp 8615
Laboratories see also *Acoustical laboratories*
surfaces, radioactivity decontam. 2149*
Laboratory apparatus
rectified r.f. appl. 1464
for gas flow experiments 3388–9
shake testing stand 4178
use of glass 4877
de-alkalizing of glass surfaces 6492
greaseless gas-handling system 9103
valve for compressed gases 9104

Labradorite
  structure and iridescence 733
Lanthanum
  atomic heat 6395
Lanthanum boride
  thermionic emission properties 3602
Latent heat see also *Heat of adsorption, etc.*; *Thermodynamic properties*
  binary systems, calc. 9757
  flash, const. press. ethylene–CO$_2$ 9758
Lattice dynamics see *Crystals, lattice dynamics*; *Spin-lattice coupling*
Lead
  viscosity/temp. relationship 107
  ion self-diffusion coeff. 657
  contact potential time variation 1032
  cascade showers 1095
  stereochemistry 1458
  crystal boundaries, energy 2077
  Rehbinder effect invest. 2112
  light-sensitivity range 2696
  friction, strength, hardness, 4°–600°K 3107, 6519
  diffusion coeff. in Hg 3180
  film, oxidation meas. 4779
  i.r.-sensitive compds., photocell appl. 5413
  single-crystal plastic deformation 5832
  polycryst., creep surface effect 6516
  superconducting, mag. field penetration 7903, 7909
Lead bromide
  melting point, inconsistencies 8689
Lead fluoride
  structure and reaction studies 1499
Lead nitrate
  elastic constants 1478
Lead oxide
  structure and reaction studies 1499
Lead selenide
  superconductivity 324
Lead sulphide
  rectification, barrier layer formation 307
  superconductivity 324
  photoconduct. kinetic invest. 1833
  photoconductive sensitivity limits 1841
  films, structure 2084
  light-sensitivity range 2696
  infra-red transmission 6858
  surface thermoelectric effects 6968
  photo-resistances, characteristics 6977
  semiconductor, irradiation effect 7860
  contact expts. 7861
  conductivity-temp. curve, effect of O and heating 7881
  crystal triode action 7889
  long-period photo-effects charac. 7894*
  photocond. cells, sensitivity and response time 7895*
  not superconducting 7906, 9490
  elec. conductivity and lattice disorder 9469
  intrinsic semiconductor 9470
Lead telluride
  superconductivity 324
  photo-conductive sensitivity limits 1841
  light-sensitivity range 2696
  photoconductivity invest. 6974
  no superconductivity 9490
Lead titanate
  Pb and Sr mixed titanates, dielectric properties 1038
  anomalous sp. ht. 5368
  Ba–Pb titanates diel. and thermal props. 5395
Lead zirconate
  dielec. props. 8716
  piezoelectricity 9453
Length measurement see also *Altimeters*; *Curvature measurement*; *Micrometry*; *Strain gauges*; *Thickness measurement*
  optical radar surveying system 862
  inaccessible discussions, with microscope 1632
  range-finding errors, dist. 1633
  precision photogrammetric methods 2289
  radar appl. in surveying 2354
  metallic capillaries, int. diam. 2402
  new Leitz instrument 4125
  microscope spheres dia., interferometric 4126
Length measurement—*contd.*
  triangulation treatise 7498
  null indicator electromag. gauges, improvements 8539
Length standards
  mm wavelength Michelson interferometer as sub-standard 1208
  Hg^{198} wavelengths 1720
  two interferometric techniques 6896
  triangulation treatise 7498
  interferometric, review 7780
  isotope disch. lamps as spectral sources 8615
  from Hg^{198} lamps, reproducibility 9363
Lenses
  errors, Twyman–Green interferometer study 230
  differential correction, 2nd-order terms 4227
  wave theory of aberrations 4228
  principal planes, geom. construction 5235
  Si–Ge achromatic doublet 6827
  adjustable holder 6907
  acoustic, focus diffraction 8600
  spurious resolution 8612
 aspherical
  plastic, surface development and turning 173
  c.r.t. objective 932
  graphical ray-trace and surface generation methods 6829
 photographic
  lens tester 174
  objectives, stray light characteristics 1005
  wide-angle, underwater 3247
  window for underwater photography 5961
  differential correction 6099
  new $f/0\cdot71$, for cine-radiography 6667
  photo-objectives, natural vignetting 6912–13, 8668
  light dist., dependence on cosine law and exit pupil 6914
  wide-aperture, objectives, progress review 8409
  objectives, brightness attenuation 8410–11
  lens-film combination, opt. resolving power 9889
Light see also *Diffraction*, *Interference, etc.*; *Doppler effect*; *Radiation*
  parageometrical optics 918
  image formation, ultrasonic model 919
  anisotropic wave propag. 1667, 5176
  wave theory of aberrations 4228
  quantum nature, classical interpretation 7521
  partial coherence concept, optics 7782
 electromagnetic theory
  diffraction by a screen 993
  phase change on reflection from films 1762
  phase and group rel., relativistic optics 6821
  dispersive media not showing Fizeau–Fresnel effect 8852
 quantum theory see *Field theory, electromagnetic*; *Photons*; *Radiation, theory*
 velocity see *Velocity, light*
Light sources see also *Monochromators*; *Photographic light sources*; *Photometry*; *Spectroscopy*
  Hg^{198} for length standard 1720, 8615, 9363
  fluorescent lamps, colorimetry 1782, 7792
  microsecond flashes 1784
  h.p. Xe arc, u.v. radiation 1788
  short-duration, high-intensity arc 1789
  colour and colour rendering properties 1790, 6157
  cut-cable spark 1859
  compact Xe arc lamp 6162
  "exploding wires" appl. 6917
  automatic constant intensity control 8673
  vacuum d.c. arc 9412
Lighting see *Illumination*
Lightning
  leader development mechanism 336
  camera for chronophotography 765
  processes between strokes 5432
  radar echo data 5944
  upward discharges 6653
  height of thundercloud charges 8386, 9856
  spectra study 9858–9
Liquefaction, gases see also *Low temperature production*
  He, Joule–Kelvin liquefier 2620
  He, medium-capacity Linde liquefier 2628
  He, small expansion liquefier 5363
  oil-free compressor 9432

A complete list of the Subject Headings will be found at the end of the Index.

Liquid crystals
  water, structure 3383
  rotatory power and other opt. props. 6155
  nematic type, light scattering 8663
Liquid helium
  He II films, transport rates 261, 1015, 6931
  He^3 and He^4 mixtures, statistical mechanics 262
  zero-point energy 264
  liquid–solid transformation near zero 266
  He^3, He^4 solutions, vapour pressure 267, 9428
  adsorbed He II film, superfluidity and thermo-mechanical effect 1016
  He II flow velocity in creeping film 1018
  in He^3–He^4 solutions thermodynamics 1019
  dielectric constant 1020
  solid and liquid He, slow neutron scattering 1331
  film transfer, thermo-mechanical effect 1801
  ditto, infl. of geometry and temp. gradient 1802
  ditto, infl. of radiation and impurities 1803
  ditto, on glass and metals 1804
  He^3, vap. press., critical point, heat of vap. and entropy 1805
  viscosity between 2° and 5°K 1806
  He II, non-equilib. thermodynam. 1809
  Joule–Kelvin liquefier 2620
  polystyrene foam as float 2621
  cooling by mechano-caloric effect 2622
  mutual friction energy dissipations, calc. 2623
  oscillating-disk expts. 2624–5, 4341
  He II superflow press. meas. 2626
  2-fluid theory below 1°K 2627, 7816
  medium capacity liquefier 2628
  film thickness meas. 2629
  solid He thermal conductivity 2634
  He I heat conductivity 2635
  Bose–Einstein liquids theory 4344
  mobile multilayer adsorption 4345
  He II, mechano-caloric effect 5358
  He^3 solidification 5359
  properties, review 5360
  small expansion liquefier 5363
  specific heat 0·6–1·6°K 5364
  solid-fluid equilib. above 5 000 atm. 6168
  adiabatic oscillations 6175
  flow through fine channels 6176
  pressure gradients in superflow 6177
  quantum hydrodynamics 6178
  two-fluid models, non-equilib. thermodynam. 6179
  He^3 in He^4, isotope sep. 6928
  He^3 in He^4, λ-point displacement and transport effect peculiarities 6929
  He II film, sub-critical flow 6930
  thermal conductivity 7817
  pure He gas prep. by capillary superflow 7818
  2 formulations of hydrodynamics 8695
  hydrodynamics of He^3/He^4 mixtures 8696
  thermodynamic equation of motion 8697*
  vapour pressure at λ-point 8698
  He I λ point, not comparable to triple point 8708
  theory of phenomena 9427*
  pressure equation, He II 9429
  flow through wide capillaries 9430
 sound propagation
  second sound vel. in He^3/He^4 265
  periodic disturbances and attenuation 1807
  velocity below 1°K 1017
  2nd-sound vel. calc. 2627
  2nd sound in He^3–He^4, vel. relationships 2630
  pulse technique 2631
  2nd-sound vel. in He II 2632
  "temperature" shock waves, theory 2633
  2nd-sound vel. at 0°K 3497
  He II, 2nd shock? 4342
  vel. press. dependence in He II 4343
  1st sound velocity 9431
Liquid oscillations
  core in swirling liquid 3368
  resonances in water-filled pipes 8589
Liquid waves see also *Acoustic waves*
  on core in swirling liquid 3368
  transverse, propagation in eddy filaments 8549
  transverse thermal, existence 9311
Liquid waves—*contd.*
 surface see also *Tides*
  cylindrical flow ripples 873
  in sea, at sloping beach 1647, 3377/8, 4147
  sea swell, e.m. meas. device 2419
  thermopile wave meter 3229
  reflection from floating ice 3373
  force on sloping board 3374
  transfer of wind energy 3375
  surface, linearized theory 3376
  ocean wave refraction 3379
  trapping modes, theory 5150
  total reflection by deep water 5151
  pressure variations 5152
  formed by wind, drag. 5167
  effect of floating mat 6775
  tidal, and similar, propagation 7593
  effect of surface films 7594
  symmetrical gravity waves, finite amplitude 8554
  the ray-particle analogy 8555
Liquids
 structure
  water, limiting hydrostatic tension near 0°C 106
  metallic, viscosity relationships 107
  organic solutions, ultrasonic velocity 117
  thermodiffusion invest. 120
  new dielectric meas. method 287
  dielectric properties supercooled liquids 292
  paraffins solvent power irregularity 877
  organic, ultrasonic classification 910
  H_2O surface adsorption, insol. vapours 1455
  electric field effect on viscosity 1637
  viscosity at high shear rates 1640
  water, theory 2433
  liquid higher fatty acids, ultrasonic dispersion 2464
  unassoc. liquids, ultrasonic absorption 2467
  light scattering studies 2590
  vaporization entropies and internal order 2650
  N critical-region X-ray scattering 2723
  viscosity redn. at high shear-rates 3364
  ultrasonic vel. and compressibilities, organic solns. 3409
  n-butane mono-substituted compds., Raman spectra 3461
  int. energy variations, ultrasonic methods 4150, 6065
  ethyl alcohol and benzene X-ray diffract. 4786
  water, D tracer self-diffusion meas. 5160
  ultrasonic vel. temp. dependence in alcohols 5179
  molec. config. rel. to scattering polarization 5335
  adsorbed water, 3·15-cm wave absorption 5613
  adsorbed water; kilometric wave absorption 5614
  u.h.f. radiowave absorption, opalescent mixtures 5615
  nuclear mag. resonance fine structure 6066
  limiting −ve press., some organic liquids 6768
  ultrasonic field intensity dist. 7629
  supercooled liquid P 7809
  nuclear proton resonance in liquid hydrocarbons 8109
  organic liquids, ultrasonic absorpt. 8595
  X-ray scattering, theory 8764
  supercooled phenyl ether surface tension 9310
  ultrasonic irradiated, local viscosity var. 9317
  information from acoustic studies, review 9342
 theory see also *Association, liquids*; *Dielectrics, theory*; *Diffusion, liquids*; *Equations of state, liquids*
  lattice theories 115
  ultrasonic absorption 146
  energy transport mechanism, analysis 224
  He zero-point energy 264
  ultrasonic absorption from thermal considerations 1675
  1–1 electrolytes soln. critical curve, appl. 1800
  Nernst dist. acceleration by ultrasound 2423
  water structure 3383
  transport processes, recent theory 3384
  light scattering by, polarization 3467
  viscosity, temp. dependence 4138
  statics of fluids 4140
  distribution function in phase space 4148
  free volume 4149
  atomic dist. function 4151
  energy transport, solutions fluorescence study 4301
  thermo-mech., ionized fluids 4355

Liquids—*contd.*
theory—*contd.*
cluster integrals and Thiele semi-invariants 5156
swarms theory, consequences 5157
Onsager liquids, electrostriction theory 5399
ultrasonic vel. and adiabatic compressibility 6065
equation of state 6188
virial coeffs. and Born–Green theory 6776
viscosity of binary mixtures 7584
eq. of motion of viscous liq. 7588
symmetric, finite amplitude, gravity waves 8554
Born–Green, X-ray scatt. appl. 8763
ionic liquids viscosity 9293
transverse thermal waves 9311
dipole moments calc. from sound velocity 9315
infinitely dilute solutions 9320
Lithium
metallic, cohesive energy 2880
analysis in minerals by neutron irradiation 4884
correlation energy and heat of sublimation 5629–30
and sun's internal circulation 6689
rotating evaporated target 7022
thermal ionization 7983
Lithium ammonium tartrate
ferroelectric props. 5391
monohydrate, new ferroelectric crystal 6203
Lithium chloride
films, as hygrometer 9797
Lithium fluoride
refractive index temp. variation 933
luminescent decay 2557
thin film refractive index 2575
thermal conductivity 2599
crystal, thermal expansion 3189
refractive indices 3426
single crystals, spin relaxation times 3633
quantum mech. calc. of crystal 3681
films, thickness meas. 6144
refractivity 9362
Lithium halides
crystals, ionic conductivity 1482
Lithium hydride
state of ionization 9833
Lithium sulphate
vibration spectrum 8652
Lithium thallium tartrate
ferroelectric props. 5391
Loudspeakers see *Acoustic radiators*
Low-temperature phenomena see also *Liquid helium*; *Superconductivity*; *Superfluidity*
Bose-Einstein gas model, heat transfer 263
He liquid-solid transformation 266
KTaO$_3$ ferro-electric Curie point 294, 1818
alkaline earth titanates, diel. props. 295
Ge resistivity 310
semiconductors, resistivity 311
resistivity change by cold working 328
magnetic anisotropy periodicity 488
ferromagnetism, steel sigma phase 493
Chroman B2Mo thermal conductivity 1010
sp. heat gases ratio and Nernst theorem 1029
de Haas–van Alphen effect at 1·1°K 1176
paramagnetic salts, nuclear specific heat 1183–4
quantum mechanics appl., review 1599
thermal diffusion measurements 1654
transport phenomena, mixed system 1663
effect on i.r. spectra 1716
quartz, thermal conduct., neutron irrad. effect 1793
Sn, Hg, In and Ta thermal conductivity 1794
MnBi alloy elec. conduct. and Hall effect 1925
chromic sulphate alums paramag. resonance absorpt. 1932
potassium chromic alum thermal props. 1933
SiC anomalous Hall effect, mechanism 3519
elec. conduct. of Fe films 3530
elec. resist. of Au, Ag, Cu 3531
periodic field-dependence of magnetism 3624–5
In, Hall effect and magnetoresistance 3672
supercooled liquid behaviour 4160
benzene crystals absorption spectra effects 4259
thermal expansion, electron contrib. 4329
magnetite cation arrangement 4523
BaTiO$_3$ diel. props. 5396
Low-temperature phenomena—*contd.*
Co ammonium sulphate, magnetic properties 5571, 5582
FeNH$_4$ alum mag. properties 5581
CuK Tutton salt, mag. props. 5586
antiferromagnetism, low temp. 6345
ferromag. metals elec. resist. in mag. field 6368
alloy thermal conductivities 6920
thermal conductivities, dielectric solids 7802–3
Faraday effect thermal var. in liq. O 8075
metal surfaces contact, thermal resist. 8677
electron path-length problems, metals and semiconductors 9460
thermoelectric effect suppression 9497
de Haas–v. Alphen effect, Al, Cd, Be, Mg, Sb, Sn, In 9601, 6326
paramag. single cryst. nucl. effects 9602
CsTi alum, sp. ht., magnetism 9603
Co Tutton salt antiferromag. transition 6350
Low-temperature production see also *Liquefaction, gases*
adiabatic demagnetization process 268
electrothermic refrigeration 330
Joule–Kelvin liquefier 2620
mechano-caloric effect in He 2622
med. capac. liquefier 2628
small expansion liquefier 5363
modified Hilsch apparatus 8700
oil-free gas-tight compressor 9432
Low-temperature technique
absorption, luminescence of micro-objects 193
Raman effect apparatus 1756
variable-thickness i.r. absorption cell 1730
thermometrical research, review 1808
thermometry, resist./temp. rel. 1811
float for liquid helium 2621
Raman cryostat 4297
u.v. absorption spectroscopy apparatus 5245
air-rectifying app. explosion 5361
cryostat for 4–14°K 5362
device for X-ray diffraction studies 5912
thermal switch 6174
liq. N, const.-level control 6932, 7819
dry ice thermostat 7823
air-rectifying apparatus explosions 8694
Ohio cryogenic lab., temp. scale 8699
cryostat for jet freezing study 8702
Lubrication see also *Friction*
conference report 866
surface properties of polar silicones 1454
water and air, bearings tests 2413
fatty acid and soap films on metal 3071
alphatic esters and alcohol films on metals 3072
hydrodynamic, general survey 3363
cotton and other textiles 3834
boundary and extreme-pressure, survey 3835
boundary layer function 3836
boundary, scuffing temperatures 3837
with solids 3838
rough steel by metallic soaps 3839
metals, by long-chain compds. 3840
scuffing investigation 3841
effect on friction, wear and abrasion 3842*
oil viscosities at high shear rates 3843
boundary, monolayer film structure 3846
extreme-pressure, and surface welding 3847
rheology of films 3848
mixed liquids props., and spreading 3849
film adsorption, radioactive tracer study 3850
at extreme press., mineral oil 4141
films on clean metals 8278
metallic transfer, autoradiog. study 9036
Luminescence see also *Counters, scintillation*; *Fluorescent screens*
micro. objects, low temp. 193
radiation-bombarded solns.; energy transport 224
image converter, chromatography appl. 728
similarities to blue spectrum 948
beta-induced, G.M. counter detection 1129
flashing-phosphor i.r. photography 2288*
phase fluorometer duration meas. 2552
photoluminescence, decay, depolarization 2553
phosphor efficiencies for cosmic-ray scint. 2572
i.r. phosphophotography, solar protuberances 3267

Luminescence—*contd.*
- decay times, u.v. and γ-ray excited cryst. 3450
- bodies with several activators 3453
- α-rays on thin films 3462
- u.v. scintillators for G.M. counter 3589
- irradiated crystals invest. 4288
- solid, noncrystalline phosphors, pulse sizes 4292
- solid-state absolute theory 4293
- electrophotoluminescence, long-wavelength radiation effect 4300, 6139
- radiance amplification, multi-stage system 6135
- crystals, ionization mech. 6136
- data for scintillation counters 6280
- phospherescence—and photoconductivity—relaxation 6885
- comparison with photoconductivity, ZnS 6886
- coloured solns. meas., absorption correct. 7758
- fluorescence, pigments comparison test 7763
- fundamental polarization and torsional vibrations 7764
- secondary-electron emission, common phosphors 7774
- excited phosphor rods as light sources 7776
- **gases**
  - in explosion flame 1760
  - A, fluorescence yield 5294
  - excitation of OH- and SH-band systems 6884
- **inorganic substances**
  - in phosphors, α-particle destruction 209
  - sulphide phosphors, theory 211
  - mechanism in variable compds. 215
  - phosphors, ultrasonic wave-illumination 219
  - colour centres in alkali halides 732
  - industrial diamonds 968
  - diamond, rel. to structure 969
  - phosphors saturation, sulphide and silicate compared 970
  - rare-earth-activated phosphors 1751
  - solid non-cryst. scintillation phosphors 1750
  - electrophotoluminescence, temp. effect 1759
  - activator interaction in phosphors 2554
  - efficiency rel. to activator conc. 2555
  - crystal phosphors, temp. rel. to conc. extinction 3448
  - phosphor peripheral layers, molec. struct. 3452
  - diamond, origin of fluorescence 3456*
  - cathode, of cryst. quartz 4289
  - phosphors for counters 4471
  - quenching by irradiation 5293
  - crystal phosphors, glow curve interpretation 7759
  - sulphide phosphors, radiationless transitions 7760
  - Ag-activated halophosphate phosphors 7761
  - transparent films 7765
  - phosphors for erythema lamps 8647
  - sulphide phosphors, band model, activator levels 8648
  - α–Al_2O_3 : Cr, reduction processes influence 9388
  - $CaSO_4$: Mn, far u.v. 8649
  - CdS cryst., var. with α-irradiation 5298
  - CdS, efficiency 6967
  - KBr decay 2557
  - KI, Tl impurity effect 218
  - LiF decay 2557
  - Mg germanate, Mn-activated 965, 1749
  - MgO, crystalline 210
  - Mg_2TiO_4 : Mn, reduction processes influence 9388
  - N_3Cl and NCl_3 explosive decomp., chemiluminesc. 8655
  - NaCl monocrystals under thermal treatment 1748
  - NaCl phosphorescence decay study 6883
  - NaCl–Ag, u.v. scintillation 3582
  - NaCl–Ag, high-energy radiation excitation 6892, 7775
  - NaCl : Pb phosphors, optical properties 2559
  - NaI–Tl eff. for electrons and heavy particles 6893–4
  - NaI–Tl in γ- and X-ray spectra meas. 3591, 7217
  - SiC carrying current 8654
  - Zn phosphors weakly excited, mech. 6879
  - ZnS/CdS visible ultrasonic waves appl. 160
  - ZnS/CdS, Cd det. electrolytic 9107
  - ZnS and Zn silicate phosphors, adhesion 1753
  - ZnS–Cu, oxidation colour effect 967
  - ZnS : Cu, i.r. effect 2556
  - ZnS : Cu phosphors, eff. rel. to temp. 4290

Luminescence—*contd.*
- **inorganic substances**—*contd.*
  - ZnS–Cu phosphors, role of Cl 7762
  - ZnS–Cu, Fe quenching action 9391
  - Zn_2SiO_4 : Mn, decay curve 220
  - Zn_2SiO_4 : Mn, cathodoluminescence 3455
  - Zn_2SiO_4–Mn, thermoluminescence due to As addition 9392
  - ZnS films, electron penetration and scatt. 7777
  - ZnS : [Zn] and ZnS : [Zn] : Cu 1752
- **organic substances**
  - scintillations in liquids and solutions 212
  - naphthalene–anthracene, temp. characteristics 213
  - liquid scintillator decay time and eff. 214
  - chelate compds., polarization 216
  - anthracene crystals scintillation eff. 985, 1127, 2766
  - ditto, directional fluorescence 5297
  - alcoholic aromatic solns., decay 1747
  - fluorescence eff. and Franck–Condon freq. 1217
  - scintillation decay times det. 2571
  - alpha-particle scintillations 2573
  - dye vapours, polarization fluorescence 3449
  - solutions and crystals, efficiency 3451
  - $\alpha\alpha'$ dinaphthyl, high-energy radiation excitation 3454
  - quinine sulphate hydration 3463
  - acetone vapour 4291
  - phosphor–plastic systems 4294
  - high-energy irradiated solutions 4301
  - anthracene, electron energy studies 4470
  - anthracene fluorescence quenching 5292
  - dyestuffs, solid soln. in plexiglass 5295
  - u.v., formaldehyde, vibr. anal. 5299
  - anthracene, proportional counter appl. 5497
  - anthracene, neutron detection appl. 5809
  - dye phosphors rel. to H bonds 5893
  - 3, 4-benzpyrene in frozen solutions 6880
  - Eu and Sm benzoylacetonates photo-luminescence 6881
  - phosphors, decay times 6882
  - anthracene and stilbene response to heavy particles 6893
  - anthracene eff. for electrons and heavy particles 6894
  - non-cryst. solids, radioactivity meas. appl. 7035
  - terphenyl in xylene as neutron detector 7036
  - scintillation counter studies 8797
  - crystals, scintillation mech. 9389
  - crystalline stilbene 9390
  - scintillation, γ- and ionizing rays 9393

Luminescence spectra see also *Spectra, resonance*
- Ca halophosphate phosphors 217
- Mn-activated Zn silicate 220, 971, 7766
- scintillation solutions and crystals 221
- X-ray, alkali halides 222, 3458
- shift due to energy transport 224
- O_2 auroral afterglow 537
- variable composition bodies, separation 966
- CF_2, absorption 972
- formaldehyde u.v., Coriolis perturbation 973
- toluene and benzonitrile, near u.v. 974
- KCl–Tl, absorption and emission, calc. 1754, 4293
- KBr and LiF 2557
- crystals and uranyl–sulphate solns. 2558
- NaCl : Pb phosphors 2559
- K_4MnCl_6 and KCl(Pb + Mn) 3457
- phosphor-plastic systems 4294
- tungstates excitation spectra 5303
- KCl–Tl phosphor, low-temp. 5306, 6854
- acridine derivs., temp. and viscosity influence 6887
- uranyl nitrate, water of cryst. influence 6888–9
- highly coloured liquids, p.e. meas. 6890
- ZnO 8650

Luminosity see *Stars, magnitudes*

Magnesium
- stress-strain curves 665
- effect on oxide cathode 3600
- de Haas–van Alphen effect 3624, 9601
- low-temp. resist. min. meas. 4376
- alloys with Sb, barrier layers 5404
- alloys, developments, review 7439
- single crystals, etching cavities and figures 9128

Magnesium antimonide
- layers, photoconductivity 1843

Magnesium chloride
  soln., diel. props. u.h.f. 9444
Magnesium fluoride
  thin film refractive index 2575
Magnesium germanate
  phosphor, Mn-activated, temp. dependence 965
  Mn-activated, fluorescence 1749
Magnesium oxide
  crystalline, fluorescence 210
  refractive index temp. variation 934
  crystal, thermal expansion 3189
  diffuse reflectance 6133
  secondary emission 7018
  dia. meas. by X-ray scattering 9020
Magnesium sulphate
  hydrated, crystal nuclei orientation in electric field 2156
  aq. soln., ultrasonic absorption 4189
Magnetic field measurement
  very weak, detection; electron microscopy appl. 1172
  Bi elec. resistance method 2819
  magnetic systems opt. parameters det. 3623
  with peaking strips 7061
  calibration with proton magnetic resonance 7227
  axially symmetric systems 9584
  flux lines direction det. 9585
  oscillating coil method 9586
Magnetic fields
  model betatron and synchrotron magnets, meas. 381
  definition difficulties 483
  plane circular loop 484
  in conducting materials 485
  metallic particle study 510–11
  corrosion current detection 702
  pulsed, production 1173
  vector potential dist. mapping 1174
  mapping methods 1941
  magneto-hydrostatic fields 1942
  transient, for Faraday and Cotton–Mouton effects meas. 1953
  neutron refraction 2071
  3-dim. depiction by discharge tube 2825
  directional stresses, influence on magnetization curve 2840
  due to current in straight conductor, invest. 2843
  100-kW solenoid design 2844
  analytical approx. for dist. near poles 3558
  radiowave mag. rotatory polarization and birefringence 3639
  RaE radiation acceleration? 3675
  interstellar, strength 4045
  lines of force 4361
  Marton's electronic exploration method 4429
  classical motion of rigid charged body 4540
  intense, short-duration, apparatus 4562–3
  of high current gas discharge 5429
  orientation of para- and diamagnetic rods 5556
  fluid mappers 6056
  of Galaxy, and cosmic rays origin 6679
  of Galaxy, origin theory 6680
  critical, of Al, Cd, Ga and Zn 6979
  stability of magneto hydrostatic fields 7109
  particle motion in field 7649
  penetration into superconductors 7909
  rotation effect on acids and bases 8082
  air core homopolar disk generator 8849
  within ferromag. metal 8866
  axially symmetric systems for generating 9584
  generation by fluid motion 9842
Magnetic hysteresis
  formation of rectangular loops 498
  ferromagnetic block 499
  ferromagnetic domains 500
  explanation of ferromagnetic magnetization anomalies 502
  tracing asymm. curves 503
  Fe–Si single crystals 1186
  ferromagnetics, discussion; sound recording appl. 1187, 9606
  igneous rocks 1526
  thermal hysteresis in ferromagnetics 1934
  model theories, critical disc. 1935
  meas. by ballistic diff. method 2817
Magnetic hysteresis—*contd.*
  inertia and damping const. of domain boundaries 2834
  coercive alloys, temp. dependence 2839
  baked clays and rocks, remanent mag. 6330
  MnBi, Mn_2Sb, Co and Co ferrite 7067
  ferromag. props. in weak fields 7081
  Mn mixed ferrites in weak alternating fields 7102
  Permalloy magnetic viscosity 8041
Magnetic measurements see also *Magnetic field measurement; Terrestrial magnetism*
  tracing asymm. hysteresis curves 503
  h.f. permeability 508, 2826
  vector potential dist. mapping 1174
  ballistic impulse difference method 2817
  for ferromag. saturation magnetization 2818
  torsion balance for anisotropy meas. 2835
  paramag. absorption on small samples 2837
  magnetic surveys organization 3220
  gyromagnetic constant 4524
  balance for ferromag. matls. study 4538
  Fe gyromagnetic ratio 5587
  susceptibilities, dynamic method for small fields 7059
  susceptibility by Faraday method 7060
  magnetization charac. ferromag. elements and alloys 7103
  susceptibilities, form of pole pieces 8017
  coercive force det. 8018
  null-coil pendulum magnetometer 8831
  mag. constants by Faraday method 8832
  para- and ferromag. suscept., Sucksmith's method modification 8838
  paramag. susceptibility in dil. solns., micromethod 8842
  "compensated" balance for atomic mag. mom. det. 8906
Magnetic properties of substances
  de Haas–van Alphen effect in Be and Zn 488
  ditto, in Ga, Sn and graphite 1176
  ditto, in Cd, Be, Mg, Sn, In 3624, 9601
  ditto, in Al and Sb 6326
  Ag salts 489
  highly coercive alloys, anisotropy const. 494
  rectangular hysteresis loops 498
  steel, temp.-dependence of coercive force 509
  effect of oriented crystals 745
  magnetic powders, e.m. wave invest. 1040
  urania-thoria solid solns., susceptibilities 1180
  W bronzes 1181
  oxide catalysts, susceptibility, rel. to activity 1403
  igneous rocks 1526
  ferro- and paramagnetics, Curie const. calc. 1919
  Eu and Sm amalgam, susceptibility 1922
  potassium chromic alum, low temp. 1933
  mag. moments in superconducting Sn 2706
  In cryst. susceptibility and anisotropy 2827
  Cu sulphate 2838
  Eu II and III ions, susceptibilities 3148
  mica, anisotropy 3637
  C_8K, C_8Br 3879
  halides of ter- and quadri-valent U 4535
  Ta abs. suscept., Pt, Pd, Rh 5575
  $FeNH_4$ alum low temp. 5581
  CuK Tutton salt, low temp. 5586
  metallic-obstacle media 5610
  substances having anomalous properties 6312
  hydrates of B compounds 6327
  baked clays and rocks 6330
  neutron diffraction study of paramag. and antiferromag. subst. 7072
  Mg-rich Gd–Mg alloys 7095
  Pr oxides, susceptibilities 7099
  UCl_4 susceptibility 7100
  As organo-metallic compds., susceptibility 8024
  recent developments 9591
 diamagnetic
  Mn–As ferromagnetic resonance 491
  $ZnSO_4 . 7H_2O$, low temp. 2646–7
  large aromatic systems 3641
  silicones 5585
  persulphuric ion 7714
  some liquids, mag. constants 8832
  substituted ethyl malonates, susceptibility 8847

Magnetic properties of substances—*contd.*
- **ferromagnetic**
  - Co–Ni crystal domain structure 507
  - Ni films, magneto-resistance 525
  - antiferromagnetism, Weiss molecular field theory 481
  - resonance in antiferromagnetic matls. 490
  - antiferromag. compds., deformations 492
  - sigma phase in steel, low temp. 493
  - iron oxide aerosols 712
  - Co, magnetic moments and Curie points 1177
  - ferro spinels for radio frequencies 1179
  - isolated and connected grains, coercive field 1189
  - Co–Cu and FeNi–Cu 1923
  - boroferrites, thermomagnetic invest. 1924
  - MnBi alloy, galvanomagnetic effects and elec. conduct. 1925
  - Fe–Ni alloys, anomalies, superlattice formation 1927–8
  - ferromag. resonance in Ni ferrite 1929
  - Alnico V magnetic anisotropy 1936
  - Cu–Zn ferrite cation dist. 1937
  - Si–Fe magneto-resistance 1954
  - Fe–Co alloy single crystal magnetostriction const. 1956
  - Fe–Ni, Pt–Co, Pt–Cr, Pt–Mn progressive intermittent activation 2820
  - Ni, energetic anisotropy 2829
  - finely dispersed substances 2830
  - Mo-permalloy at 3 000 Mc/s 2832
  - oxide materials, inhomogeneity effects 2833
  - α-$NiSO_4 . 6H_2O$ anisotropy 2835
  - MnF_2 anisotropy 2836
  - steels, permeability rel. to tension 2878
  - magnetite containing Al^{3+} ions, rel. to structure 3626
  - alloys of Mn with Ni and Co, invest. 3627
  - ordered alloys, invest. 3630
  - polycrystalline, closed flux shells 3631
  - alloys for instr., devel. 3827
  - $Zn_{0 \cdot 55}Mn_{0 \cdot 45}Fe_2O_4$, cryst. magnetic anisotropy 4520
  - resonance in ferrites 4521
  - magnetite low temp. cation arrangement 4523
  - gyromag. const. ferromag. elements and alloys 4524
  - magnetite, sp. heat and Hall effect 4526
  - Alnico 5 precipitation and domain struct. 4527
  - thin films 4528
  - Ni crystals, domain patterns 4536
  - mag./temp. curves, Ni, Fe_3O_4 and Fe_3C 4538
  - Fe_3O_4, proved antiferromagnetic by neutron scattering 4764
  - Ni_3Fe, internal friction var. calc. 4805
  - Fe and Fe oxide catalysts 4836
  - Ni and alloys 5555
  - mixed Mg–Zn ferrites 5558
  - magnetite particles, thermoremanence 5559
  - Ni bicrystals, domains 5560
  - ferrite cores, high permeability 5562
  - magnetization curves, Mn, Ni and Zn ferrites 5563
  - MnBi spontaneous magnetization 5565
  - resonance absorption in antiferromag. matls. 5564
  - Fe–Al, Fe–Si and Fe–Al–Si, superlattice studies 5567
  - magnetite, neutron interaction appl. 5568
  - antiferromagnetic compds. cryst. struct. transitions 5569
  - Fe gyromag. ratio 5587
  - Fe–Si crystals, domain struct. 5588–9
  - Mn compds., Curie temp. rel. to conductivity 5670
  - ferromag. anomaly in ferrites thermal expansion 6328
  - antiferromag., exptl. evidence 6331
  - NiO and CoO antiferromagnetism 6332
  - αFe_2O_3 6333, 7077
  - non-metallic compds. 6334
  - Mn compds. with perovskite struct. 6335
  - metallic dysprosium 6336
  - MnAs and MnBi transformation points, rel. to antiferromag. 6337
  - ferrites, review 6338
  - ferrites, exptl. invest. and theory 6339
  - ferrites, spont. magnetization 6340
  - Fe, Co and Ni ferrites, paramagnetism 6341–2
  - FeB_2 6343
  - transformer steel, coercive force temp. dependence 6344
  - Mn–In system ferromagnetism 6345

Magnetic properties of substances—*contd.*
- **ferromagnetic**—*contd.*
  - antiferromagnetism in single crystal 6346
  - antiferromag. at low temp. 6348
  - Co Tutton salt, antiferromag. transition curve 6350
  - MnBi, Mn_2Sb, Co and Co ferrite, rotation magnetization 7067
  - transition metals, rel. to electron conc. 7069
  - Fe group, gyromagnetic ratios 7073
  - Fe–Ni alloys, structure rel. to props. 7074
  - isoelectronic face-centred cubic alloys 7075
  - permanent magnet matls., progress 7076
  - Fe–Si single crystal domain widths 7078
  - Ni films resonance absorption 7080
  - in weak fields, review 7081
  - binary ferrites low temp. *g*-factors 7082
  - Si ferrite annealing, effect on orientation 7083
  - Fe–Si alloys heat treated in mag. field 7084
  - Mn ferrites in weak alternating field 7102
  - magnetization charac., elements and alloys 7103
  - cementite Curie temp. changes, rel. to textural changes 7104
  - soft polycryst., ideal magnetization curves 7106
  - Co spontaneous magnetization 7107
  - ferrite, magnetization processes 7108
  - resonance invest., Lecher system propag. const. det. 7120
  - Co domains observation by Kerr effect 7137
  - ferrites at h.f. 7839, 8720
  - Cr and Fe sulphides 7851
  - Curie point dependence on magnetic field 8019
  - Co–Mn system, ordered alloys 8021
  - antiferromagnetism and Cr_2O_3 struct. 8025
  - magnetite, reson. absorpt. 8028
  - β_1 phase of Co–Zn alloys 8030
  - ferrites, struct. and props. 8031
  - Ni ferrite 8032
  - Mn-ferrite, new mag. transition 8033
  - "Alfer" alloy dynamic magnetostriction characteristics 8034
  - Permalloy, magnetic viscosity 8041
  - Alcomax, torque curves, etc., 8042
  - Perminvar, Barkhausen jump and internal stress 8046
  - Alnico and Vicalloy, hysteresis of magnetostriction 8048
  - Ni initial susceptibility under tension 8080
  - natural and synthetic magnetite crystals 8831
  - ferro-nickel powders 8839
  - resonance absorption and new low-temp. transition, $NiOFe_2O_3$ 8840
  - resonance absorpt., low temp., in $MnOFe_2O_3$ 8841
  - PuF_3, $PuCl_3$ 8845
  - Ni alloys, spontaneous mag. 8848
  - effect of thermal treatment 9592
  - partially oxidized Fe and Fe–Co powders 9593
  - FeS_x ferrimag. and antiferromag. behaviour 9594
  - Ni magnetization, reversible effects 9595
  - magnetite structure transition and antiferromagnetism 9596
  - temp.-dependence of mag. viscosity 9607
- **paramagnetic**
  - cupric salts, adiabatic susceptibility 1183–4
  - CuCs sulphate, low temp. 1930
  - O, analysis appl. 3890
  - resonance in metal ammonia solns. 4532
  - paramag. crystals low temp. 5578
  - Co ammonium sulphate, 1°K 5582
  - Fe and Co salts, solutions 5583–4
  - transition metals, rel. to electron conc. 7069
  - $MnSO_4 . 4H_2O$ 7086
  - susceptibility in dil. solns. det., micromethod 8842
  - resonance absorpt. in 3 Cu chlorides 8844
  - $CuSO_4$ solutions 9598
  - single cryst. nucl. effect invest., v. low temp. 9602
  - CsTi alum, low temp. 9603

Magnetic relaxation
- LiF single crystals 3633
- meas. in presence of inhomogeneity 6352

Magnetic storms
- solar influence theory 2191
- corpuscular origin, review 2204
- Chapman and Ferraro's theory 3223, 8371–2

A complete list of the Subject Headings will be found at the end of the Index.

Magnetic storms—*contd.*
  model experiment 3998
  solar-flare corpuscular streams effect 5030
  effect on *F*2-layer ionization 7407–8
Magnetism see also *Diamagnetism*; *Ferromagnetism*; *Gyromagnetic effect*; *Paramagnetism*; *Stars, magnetism*; *Terrestrial magnetism*
  units discussed 1171
  boundary value problem in uniform field 1175
  magneto-hydrodynamics, isotropic turbulence 1646, 6774
  Maxwell stresses 1920
  magnetic monopole, theory 2064
  magneto-hydrodynamics, textbook 2309
  at 0°K 2704
  magnetic conversion spectra 2828
  rel. to gravitation, kinematical relativity 3314
  forces between sphere and wire 4360
  recent work, review 5548
  antiferromagnetism, itinerant electron model 5553
  magnetic effects and Hartree–Fock eq. 5561
  antiferromag. theory, recent developments 6313
  ferromag. intermittent activation, origin 6316
  magnetic anisotropy, quantum theory 6318
  antiferromagnetism, low temp. 6348
  metallic monocrystal in mag. field 7062
  intermittent activation theory appl. 7065
  the coercive field 7066
  limitations of Rayleigh law appl. in alternating fields 7068
  diamagnetism of free electrons in finite systems 7071
  cooperative phenomena, theory 7144
  free mag. poles, passage through matter 8833
  of rotating bodies 9258
  magnetic forces, direct calc. 9451–2
Magnetite
  thermal expansion 1476
  elec. conductivity, temp., dependence 1829, 5403
  containing Al^{3+} ions mag. props. 3626
  low temp. cation arrangement 4523
  sp. heat and Hall effect 4526
  particles, thermoremanence 5559
  resonance absorption 8028
  single crystals, elec. and mag. props. and thermal expansion 8831
  struct. transition and antiferromagnetism 9596
Magnetization see also *Demagnetization*
  de Haas–van Alphen effect 486–8, 1176, 3624–5, 6326, 9601
  mechanism in Alnico V 1188
  magnetic after-effect, Barkhausen jumps 1190
  heat changes accompanying; effect of strain 1191
  Barkhausen discontinuities and rectangular hysteresis loops 498
  ferromagnetic matl., Rayleigh law exceptions 502
  surface currents vector density 504
  Fe coercive force theory 505
  variation with field, ferromagnetics 506
  Co–Ni crystal domain structure 507
  ferromagnetic h.f. permeability 508
  Barkhausen effect, Rochelle salt 1822
  Fe single crystal, effect on thermal e.m.f. 1854
  permeability anistropy of Fe–Si in weak fields 1926
  model theories, critical disc. 1935
  Cu–Zn ferrite cation dist. 1937
  ferromagnetic, reversible susceptibility 1938
  domain boundary displacement after-effect 1939
  ferromagnetic laminae, dist., relaxation det. 1940, 6355
  mag. moments and eddy currents in superconducting Sn 2706
  magnetic counting scaler 2770
  Ni, energetic anisotropy 2829
  coercive alloys, temp. dependence 2839
  curve form, directional stresses effect 2840
  coercivity powdered alloys, rel. to particle size 2841*
  100-kW solenoid design 2844
  spontaneous, in ferromagnetics, and photoelectric effect 3629
  counter inversion in ferromagnetics 3642
  magnetic viscosity rules 3643–4
  Goldhammer effect in ferromagnetics 3673
  magnetite low temp. cation arrangement 4523
Magnetization—*contd.*
  ferromag. media, spin-wave theory 4525
  thin ferromag. films 4528
  non-reversible sudden changes invest. 4537
  mag./temp. curves, ferromag. subst., det. 4538
  adiabatic, of superconductor 5422
  recent powder pattern expts., review 5548
  mixed Mg–Zn ferrites 5558
  in ferrites 5563
  spontaneous, MnBi, rel. to polymorphism 5565
  Co amm. sulphate adiabatic demagnetization 5571
  Fe–Si crystals, domain struct. 5588
  Fe–Si domain wall movt. 5589
  magnetic hardness, dislocation theory 5590
  Hall effect in ferromagnetics 5622
  steel rod, effect on ultrasonics propag. 6081
  anisotropy, quantum theory 6318
  spontaneous, of ferrites 6340
  coercive force temp. dependence, transformer steels 6344
  superstructure transition energy anisotropy change kinetics 6354
  by rotation, susceptibility, coercive field 7067
  Rayleigh law applicability limitations 7068
  binary ferrites low-temp. *g*-factors 7082
  saturation intensity and related measurements 7103
  cementite Curie temp. changes, rel. to textural changes 7104
  associated thermal effects 7105
  ideal curves of soft ferromagnetics 7106
  Co, spontaneous 7107
  processes in ferrite 7108
  influence on ultrasonic attenuation in Ni or Fe–Si single crystal 7636
  ferromag. reson. absorp., magnetite single cryst. 8028
  new transition of Mn-ferrite 8033
  Ni domain patterns 8043
  Ni single cryst., new Bitter patterns 8044
  coercive force theory 8045
  Perminvar, Barkhausen jump and internal stress 8046
  ferromag. domain boundary displacement due to tension 8047
  Alfvén's magneto-hydrodynamic waves, dispersion, eq. 8062
  ferrites, temp. dependence theory 8834
  spontaneous, Ni alloys 8848
  Fe, sat., var. under compression 8868
  Ni, reversible effects 9595
Magnetochemistry see also *Chemical structure, magnetic effects*
  chemical reactions in field 1210
  Eu and Sm amalgam, susceptibilities 1922
  halides of ter- and quadri-valent U 4535
  Mn valency in dioxides, evidence 4864
  Fe and Co salts solutions, paramag. props. 5583–4
  nucl. induction signals, organic compds., chemical effects 5663
  hydrates of B compounds 6327
  persulphuric ion struct. 7714
  Cu and Ni salts normal dibasic acids 8022–3
  mag. field effect on acids and bases 8082
  PuF_3, $PuCl_3$ 8845
  substituted ethyl malonates, susceptibility 8847
  complexes of quadricovalent Cu^{++} and Ni^{++} 9101
Magnetoelectric effects see also *Hall effect*
  discharge in magnetic fields 335
  ferromagnetic films, magneto-resistance 525
  r.f. gas breakdown, mag. field effect 1075
  magnetite elec. cond. temp. dependence 1829, 5403
  metallic films cond., field influence 1853
  Si–Fe magneto-resistance 1954
  Landau diamagnetism and Meissner effect 2707
  Bi resistance, field meas. appl. 2819
  thermo-magnetic treatment, effect on elect. resist. 2876
  Bi magnetoresistance at 3 000 Mc/s 2877
  grey tin 3524, 7869
  Ti single crystals 3526
  In, magnetoresistance rel. to field, low temp. 3672
  Goldhammer effect, theory 3673
  plasma oscill. in static mag. field 4399
  in glass 4561
  Bi resist. changes in strong fields 4562–3, 5620, 8076

A complete list of the Subject Headings will be found at the end of the Index.

- **Magnetoelectric effects**—*contd.*
  - Te, Ettingshausen–Nernst effect 4565–6
  - photocell curr.-volt. characteristics modification 5416
  - plasma with neutral gas, mag. field effect 5430
  - heavy-current arcs, transverse mag. field 5433
  - Corbino effect and resist./field rel. 5621
  - Te film 6218
  - Faraday effect, ferromagnetics, theory 6320
  - ferromag. metals resist. in field, low temp. 6368
  - ferromag. alloys, saturation magneto-resistance 6371
  - ferromag. Faraday effect at cm wavelengths 6329
  - thermodynamics 7828
  - "internal size-effect" 7850
  - magneto-res. effect, oriented Ge crystals 7910
  - precision meas. of magneto-resistance coeff. 8077
  - Ag–Mn alloys, low-temp. resistance 8744
  - magneto resistance of ferromag. metals and alloys, low temp. 8866
- **Magnetomechanical effects** see also *Gyromagnetic effect*; *Magnetostriction*
  - rectangular hysteresis loops 498
  - Ni, magneto-acoustic effects 911
  - couple on magnet in permeable-medium field 1175
  - steels, permeability rel. to tension 2878
  - effect of plastic deform., polycrystalline materials 3631
  - Ni magneto-elastic relaxation 4794
  - ferromag. matls., internal friction 5625
  - cementite Curie temp. changes, rel. to textural stresses 7104
  - tension effect in weak fields 7140
  - Fe and C steels, permeability changes under tension 7142
  - particle motion in field 7649
  - Ni, domain wall relaxation 8081
  - Ehrenhaft magneto-photophoresis 8050
  - Ni, initial susceptibility under tension 8080
  - acids and bases rotation effect 8082
  - Fe sat. magnetization, var. under compression 8868
  - ferrite Young's mod., var. with density 9025
  - forces, direct calc. 9451–2
- **Magneto-optical effects** see also *Chemical structure, magneto-optical effects*; *Zeeman effect*
  - illuminated particles in field 511
  - magnetophotophoresis, theory 524
  - spectrum *g*-value changes with field 1721
  - in controlled colour-filter 1779
  - Faraday and Cotton–Mouton effects, meas. 1953
  - Cotton effect, macroscopic model radiowave analogy 3651
  - rotatory polarization at 3 000 Mc/s 3671
  - H_2O_2, molec. mag. rotatory power 3689
  - electronic resonance, optical detect. 5617
  - principal gases, magnetic rotatory powers 5618
  - dimethyl ether, rotatory powers 5619
  - e.m. waves in electron gas in waveguide 7126, 8853
  - Kerr effect observation of mag. domains 7137
  - cm wave Faraday effect 7138
  - magnetic resonance study, optical methods 7139
  - dipole coupling, polar liquids, theory 7835
  - Faraday effect thermal var. in liq. O 8075
  - CS_2 rotatory power, low temp. 8072
  - methane and ethylene rotatory power 8073
  - Ne and NO rotatory powers 8074
  - NaBr constants 8802
  - temp. dependence molec. rotation constants 8863
  - Faraday-elastic effect 8864
- **Magnetostriction**
  - ultrasonics source 912, 5201
  - energy changes and thermal curve calc. 1191
  - rel. to magneto-thermoelectricity in Fe 1854
  - Alnico V magnetic anisotropy theory 1936
  - single crystal constants of Fe–Co alloy 1956
  - internal elastic tensions effect 3674
  - precipitation and domain struct. Alnico 5 4527
  - prolate spheroids vibration 4567
  - electromechanical analogies appl. 4568
  - homogeneous Ni alloys 5623
  - Ni crystal, "morphic" effects 5624
  - meas. by wire strain gauges 6372
  - meas., new techniques and results 7141
  - "Alfer" alloy, dynamic characteristics 8034
  - hysteresis in Alnico and Vicalloy 8048
- **Magnetostriction**—*contd.*
  - coeff. sign change due to tension 8079
  - in rotating field 8867
  - ferrite, Young's mod. var. with density 9025
  - single crystals Fe–Si alloys 9624
- **Magnetothermal effects**
  - magnetostriction magneto-thermoelectricity rel. 1854
  - boroferrites, susceptibility rel. to temp. 1924
  - temperature magnetic hysteresis, ferromagnetics 1934
  - magneto-thermal treatment, effect on elec. resist. 2876
  - Fe and Fe oxide catalysts, thermomag. invest. 4836
  - electron ferromag. theory 5555
  - coercive force temp. dependence, transformer steels 6344
  - associated with magnetization 7105
  - thermodynamics 7828
  - Ni–Mn system, even effects anomaly 8078
- **Magnets**
  - permanent, design for cloud chambers 4478
  - model betatron and synchrotron, field meas. 381
  - new electromag., 20-kW operation 4519
  - permanent, recent progress 7076
  - design of cyclotron magnet 8049
  - magnet current stabilizer 8837
  - partially oxidized Fe and Fe–Co powders 9593
- **Manganese**
  - valency in Mn dioxides 4864
  - MnAs and MnBi transformation points, rel. to antiferromag. mech. 6337
  - oxidation states thermodynamics 8281
- **Manganese chloride**
  - hydrated, paramagnetic resonance 1185
- **Manganese dioxide**
  - cells, depolarization 698
  - depolarizing and catalytic activity 5865
  - active, thermal anal. 5898
- **Manganese fluoride**
  - solid soln., paramagnetic susceptibility 495
  - magnetic anisotropy 2836
  - nuclear magnetic resonance 3640
- **Manganese sulphate**
  - paramag. resonance 1185, 7087
  - cm wave Faraday effect 7138
- **Manometers** see also *Barometers*; *Vacuum gauges*
  - for low air velocity meas. 893
  - h.p. investigation apparatus 1386
  - new electrical method 1887
  - micromanometer, diaphragm, for mass spectrometer 3355
  - micromanometer diaphragm displacement, electronic meas. 3356
  - electronic micromanometer 3357
  - hypodermic, using bonded resist. strain gauge 4133
  - Hg cistern, null method 5141
  - membrane, physiological appl. 6053
  - recording, photographic method 7582
  - null-reading diaphragm 7583
  - appl. of heat conduction in gases 8679–80
- **Mass spectra** see also *Chemical analysis, positive rays*
  - C_2N_2, HCN, CClN 1135
  - BF_3 and BCl_3 electron collision products analysis 1257
  - Tm isotopic constitution 1258
  - simple isotopic molecules 2932
  - molecules, effect of isotopic substitution 2934
  - C_1–C_4 monodeutero paraffins 4483
  - propanes, butanes containing C^{13} 4484
  - chloroform dissoc. probabilities, isotope effect 4486
  - H^1, C^{12}, S^{32} study 4619
  - deuteromethanes 5505
  - hydrocarbons, temp. variation 5506
  - Al, Si, P, S masses 6397
  - similar *m*/*e* ion pairs, resolution 7023
  - D-containing propane derivs. 7710
  - meas. of H^1, D^2, C^{12} and other light atoms 8149
- **Mass spectrometers** see also *Ion beams*
  - a mass indicator 379
  - for isotope abundance ratios 562
  - combined with vacuum furnace 1111
  - transverse convergence due to slit 1114
  - perfect velocity focusing 1873
  - direction double focusing 2739

A complete list of the Subject Headings will be found at the end of the Index.

Mass spectrometers—*contd.*
- 180°, for biochem. work 3576
- progress in France 3595
- magnetic defl., ion optics 4449
- 3 types, review 5477
- new magnetic-period type 5478
- French Atomic Energy Commission 6265
- momentum-mass spectrograph 6266
- similar m/e ion pairs, resolution 7023
- r.f. type 7024
- ditto, modification 378
- ion optics survey 7948
- construction problems 7949
- for cosmic ray mesons 7951
- high momentum particle sep., asymptotic trajectories appl. 8783
- math. data for ion sources electron drain 9523
- **accessories**
  - ion source optics 1113, 1874, 8791
  - diaphragm-type micromanometer 3355
  - viscous leak, gas flow 3392
  - source allowing high gas pressures 5484
  - suggested automatic trajectory tracer 8784
  - greaseless gas-handling system 9103
- **applications** see also *Chemical analysis, positive rays*
  - K salts, A content pollution correction 561
  - Cu^{64}, Br^{80}, Br^{82}, I^{128} branching invest. 582
  - gas analysis 2154, 4883
  - hydrocarbons, total ionization det. 2155
  - Cm^{243} and Cm^{244} identification 2933
  - heavy water det. 3184
  - GeH$_4$ electron bombardment invest. 3597
  - isotope rel. abundance, mass discrimination effect 3714
  - α-particles from Li and Be, Q-values det. 3764
  - S^{32} mass det. 4618
  - atomic mass doublets det. 4621
  - D det., using phosphine 4623
  - qualitative chemical analysis 4880
  - solids analysis 4885
  - reaction kinetics investigation 5484
  - in radioactivity investigations and chemistry 7950
  - mass-differences det., improved technique 8151
  - low vap. press. meas. 9421
  - leak detector 9331, 9540
  - ionization potential meas. 9559
  - respiratory metabolism study 9864

Mass standards
- stability of analytical weights 6052

Mathieu functions
- oscillatory system analysis 2460–1

Matrices
- non-uniform beam vibration det. 141
- electrostatic energy of d^np configurations 549
- electrostatic energies of f^3 in $v\alpha SL$ scheme 550–1
- force constant matrix, harmonic vibrations 1219
- proper values and direction det. 1558
- celestial mechanics appl. 1571
- eigenvalue problem, iteration method 2292
- invariant from 4 Dirac wave functions 3341
- normal coordinates det. 4027
- network for eigenvalues, eigenvectors det. 4038
- numerical calc., systematization 5971
- crystal frequencies calculation 6566
- whose eigenvalues are in arith. prog. 7444
- calculus, appl. to least sq. method in geodesy 7499
- calc. of roots by method of gradients 9224

Measurement see also *Acoustical measurements*; *Electrical measurements*; *Instruments*; *Ionosphere measuring apparatus*; *Magnetic measurements*; *Mechanical measurements*; *Radioactivity measurement*; *Recording*; *Standards*; *Thermal measurements*; *Units*; *X-ray measurement*. The measurement of a specific quantity is listed separately, e.g. *Calorimetry*; *Density measurement*
- spatial location of γ-ray-marked object 3715
- compatibility, quantum theory treatment 6020
- automatic dielectric meas. and computation 6954
- classification of scales, etc., review 9255
- **errors** see also *Errors*; *Statistical analysis*
  - range-finding, distribution 6133
  - anemometers in fluctuating winds 8373
  - reduction by curve analysis 8435

Mechanical measurements Individual quantities and instruments are listed separately, e.g. *Length measurement*
- multichannel, of physical effects 861, 4127
- ruling engine dividing gear 864
- surface roughness standard 1336
- with microscope, of inaccessible dimensions 1632
- new Leitz instrument 4125
- new ruling engine 4135
- automatic surface-waviness recorder 6767
- calibration of screws and ruling engines 7576

Mechanical strength see also *Breaking strength*; *Elasticity*; *Hardness*
- water, limiting hydrostatic, tension near 0°C 106
- metal cutting, dimensional analysis 682
- glass, crack propagation 685
- ferrochromium tearline patterns 686
- press.-vol./press.-compressibility rel. 1016, 4573
- resistance to plastic deform., effect of speed 2097
- ingot iron, low temps., factors affecting 2105
- Fredrickson–Eyring theory 2106
- shear, 4°–600°K 3107
- "block structure" theory 3676
- calc. of cohesion of alloys 3677–8
- resin-bonded materials 3828
- yielding resist., effect of free surface 4803
- Schnadt notch test, theoretical basis 4799
- penny-shaped crack under shear 5136
- widened lattice interval 6486
- plasticized polymers, rel. to brittle temp. 6514
- yield phenomenon and twinning, α–Fe 7321
- metal physics progress 7439
- metals deformation resist. at 10^{-6}–10^2 m/sec 8275
- rubber reinforcement by C black 9754
- Cu solid solutions with Zn, Ga, Ge, As 9746

Mechanics see also *Dynamics*; *Statistical mechanics*
- many-body problem 97
- parallel and rectilinear spring movements 2400
- neutral static stability, system characteristics 3346
- Newtonian force-fields 4121
- classical, rel. to wave mech. 6041
- treatment by quaternions 9288
- cable deflection, single point load 9289
- **celestial** see *Celestial mechanics*

Medical science see also *Electrotherapy*; *Hygiene*; *Pathology*; *Physiology*; *Radiotherapy*
- ultrasonic method cerebral ventricles outlining 5208
- radioisotopes in brain tumour localization 7437
- nuclear physics appl., review 8405

Melting
- methyl siloxanes, press. effect 4335
- metals, entropies 4336
- changes of elec. resistivity 6226
- crystallized bodies, gas adsorption effect 6544
- equiv. in adsorbed A 9091
- pressure, He^3 9427*

Melting point
- cubic elements 3481
- ortho-deuterium 3485
- Na stannate 5924
- rel. to thermal expansion 7808
- PbBr$_2$ inconsistencies 8689
- solvent-electrolytes, 25°C to −73°C 9321
- elements, rel. to boiling point 9419

Membranes
- use in electrical osmosis 331
- dynamic plastic deformation 3099
- theory of osmotic press. meas. 5158
- manometer, physiological appl. 6053
- det. of Soret coefficients 9319

Mercury
- zero-pressure thermodynamic properties 275
- Hg^{198} wavelengths 1720
- thermal conductivity at liq. He temps. 1794
- liquid, autodiffusion coeff. 2425
- superconducting trans. temp. mass dependence 2700
- polarography, survey 3179
- vapour pressure, streaming method 4334
- wedge effect at amalgam surfaces 5154
- heat capacity, thermodynamic props. 5369
- solubility in liquid P 7603
- superconducting, penetration depth expt. 7903

A complete list of the Subject Headings will be found at the end of the Index.

Mercury—*contd.*
Hg^{198} wavelength standard lamp 8615, 9363
X-ray spectra 9512
vapour, paper for estimation 9798
Mercury halides
molten Hg and NH$_4$ halide systems, elec. conduct. 2692
Meson field theory see *Field theory, meson field*
Mesons see also *Cosmic rays, mesons*; *Fundamental particles*; *Nuclear reactions, mesons*
interactions with e.m. field 77, 5093, 8226
π-meson and μ-pair theories 87
theory, Tomonaga intermediate coupling 88
λ-meson hypothesis 428
survey (1940–1950) 631
nature of π-meson 632
neutron interactions, negative protons search 840
4th-order meson-equation 851
as composite particle 854
emission in nuclei, mechanism 1318
spinless, quantum electrodynamics 1602
spinless, in e.m. field 1613
spinless, and nucleons in e.m. field 1614
electromag. properties 1615
static meson potentials and deuteron problem 1619
equations integration in Heisenberg repres. 2363
proton and neutron mag. moment theory 2379
nuclear forces, pseudoscalar symmetrical meson theory 2381
spin-one meson fields 2382
π- and μ-, characteristics, review 2800
complex particles? 3040
nature of τ-mesons 3045
nature of secondary radiation 3046
π^-, nuclear interaction 3048
pseudoscalar theory, coupling constants equiv. 3333
classical theory, radiation reaction 3334–5
S-matrix theory 3337
properties, survey 3791
recent exptl. work, review 4689
quantized field theories, ambiguities 5084
elementary particle theory 5106
exchange mag. moments 5109
two-meson theory, analysis 5115
anomalous mag. moment 5117
interactions with nucleons 5119
new form of theory 5122
varitrons, masses, reciprocity principle 5546
π^-, interactions in emulsions 5738
π^-, from α on C; μ^-, endings 5742
action as space coordinate, "fundamentons" 6724
interaction with nuclei 6746
an equivalence theorem 7294
scalar, self-energy in interaction with nuclei 7541
pseudoscalar theory and deuteron ground state 7546
π-meson spin from $\pi^+ + d \rightleftharpoons p + p$ 8223
cross-section for $\pi^+ + d \rightarrow p + p$ 8224
π^-, reactions in T 8225
spin of μ-meson 8230
as least neutral gravitating mass 8442
nuclear potential in meson theory 8511
pseudoscalar, theory, anom. mag. mom. corrections 8512
new mixed meson theory, *n*, *p* scattering corrections appl. 8524
coupling, nucleon mag. mom. appl. 8895–6
charged π-meson spin det. 8995
meson-type particles, "Zitterbewegung" 9276
neutral scalar, with point-contact repulsion 9279
nonlinearity in meson–nucleon coupling 9280
absorption
fast protons in π^- stars 636
by proton, probabilities 642
nuclear mesons in nucleus, mechanism 1299
π^-, in H 1300, 3041, 4691, 8219
π^- in D 2023, 3042, 4691–3, 7547, 9724
in Pb 2061
scalar and pseudoscalar, by nucleons 4102
μ-meson, low-energy electron prod. 4749
negative π-meson capture 5120
by proton in γ-ray production 5724
π-meson star production, Fermi's method appl. 5736
cross-sections on protons and other nuclei 7288

Mesons—*contd.*
absorption—*contd.*
μ-mesons, capture in heavy elements 8227
ionization loss at relativistic energies in anthracene 8228
slow μ-mesons in emulsions 9723
π^-, nuclear absorption, 30–110 MeV 9725
decay
radiative corrections 80
spinor fields, new interaction mode 84
μ, electrons energy spectrum 634, 6476, 9718
probabilities evaluation 635
π–μ, unusual track 638
μ-meson 2061, 2377
absolute selection rules 3039, 9715
π^-, experiments 3790
π^+, beta-decay, exptl. search 4750
π^+, branching ratio 4753
neutral, mean life 4754
secondary, slow meson prod., atmos. 5547
scalar mesons, radiative disintegration 5793
heavy Dirac meson 5796
coupling schemes evidence 5798
μ-mesons, non-standard schemes 5799
positive, heavy, invest. 6471
photon production, theory 7286
π^-, conversion to neutral in H orbits 7290
μ-meson lifetime 8002
capture and decay in emulsions 8222
$\mu \rightarrow e + 2\,\nu$ spectrum 8230
neutral *V*-particles decay 8810
charged π-meson into neutral due to collision 8988
π^-, lifetime meas. 8991
μ^-, β-decay, Bohr orbit binding effect 8992
$\pi^+ \rightarrow \mu^+ \rightarrow \beta^+$, photographic study 8993
π^+ lifetime meas. 8994
π_0, to $\gamma + 2e$ 9717
κ-particles, mode 9721
τ-particles, mode 9722
detection
X-ray prodn. of π^+, invest. 2062
tracks, reproductions 2801
π^+, by decay 4752
survey of techniques 5684
density of photo tracks 9720
mass
meson/proton mass ratios 6473
π^+ mass det. 6474
π-meson, by Darling's theory 6475
cohesive, and nucleon mass difference 8522
π/μ, meas. in photo emulsions 9719
production
by photons 82
π^+ and π^- by neutrons 633
by X-rays (errata) 641
multiple, in single nucleon–nucleon collision 1316
spin zero nuclear mesons, photo-production 1317
positive, by photons on H 2060
by photons, calc. 2063, 8201
multiple, from single nucleon–nucleon collisions 2810
neutral, emission in O^{16} 0 $\rightarrow$ 0 transition 2975
π^+ beam, protons on H 3043
π, low-energy, in nuclear collisions 3049
π, in nucleon collisions, theory 3338, 3788, 4751, 5116, 5800, 6748, 7286
by photon–nucleus collision 3772, 4757
in D, cross-section 3787
nucleon cascade absorption 3792
beta-decay through π-meson prod. 4670
proton–proton collisions 4748*, 5126, 5745
neutral, photo-production in nuclear fields 4754
nuclear binding effect 5118
multiple, by high-energy nucleon–nucleon collisions 5121
π^-, scalar theory 5123
by protons on D, calc. 5746
by photons on C 5767
accompanying U fission 5790
scalar and pseudoscalar, by photons 5794
γ–π process 5797
neutral, with γ-quanta in deuteron π^- capture 6448
$p + p \rightarrow \pi^+ + d^*$ 6452
photomesons, π^+ and π^-, cross-sections 6463

Mesons—*contd.*
production—*contd.*
(n, p; π^-) in emulsion 6467
μ-mesons by gamma-rays 6472
photomeson cross-section 7289
by protons in C and H 7292–3
no pairs from 322 MeV X-rays? 7295
in two-nucleon system 7545
by X-rays 8198
ditto, π^+, rel. to Z 2062
low-energy photomeson, in H 8199
photomesons from Be 8200
π^+, in C 8220
neutral photomesons, and nucleon isobars 8525
π-mesons by μ-meson e.m. field 8824
π^+, from 341-MeV protons on protons 8962
photoproduction in deuterium 8977
neutral, by γ-rays on H 8979
single mesons by γ-quanta 8987
vector π, by high-energy collisions 8989
V^0-particle decay, ang. dist. 9579
scattering
anomalous, μ-mesons by nucleons 639, 4756
Coulomb, π-mesons by light nuclei 640
by light nuclei; spin interaction 839
by nucleons, theory 2376, 5097, 7556
ditto, π-mesons 1617, 5795
π^-, large-angle 3044
interaction renormalization 3329
Møller, μ-mesons on protons 3789
scalar and pseudoscalar by nucleons 4102
π-meson, C and Al nuclei 6449
inelastic, theory 7255
by n, deduction from d experiments 7291
π-mesons, inelastic 8221
nucleus index of refraction invest. 8229
double scattering by nucleons 8990
$\pi^+ + d \rightleftharpoons p + p$ invest. 8995
184 MeV μ-mesons 9716
Metallurgy
Al ultrasonic soldering 161
ferrochromium tearline patterns 686
fluorescence examination of surfaces 1335
powder, dilatometry appl. 1337
strain-free cutting apparatus 1553
intermetallic compds. 2267
spectrographic Cr det. in iron and steel 3064
Ti micrographic study, electrolytic 3075
radioactive tracers appl. 3755
diffusion interfaces, metallographic study 3801
solid-state, A.E.C. programme 4770
new X-ray uses in metallography 4785
C and N precipitates in Fe, electron microscope study 4791
vac. furnace for single crystals 4878
metal physics progress, review 7439
prod. of alloy powder by chem. means 9888
Metals
molten, viscosity det. 109
magnetism, low-temp. field-dependence 486–7
volume diffusion, frequency factor and activation energy 660
interaction and hardness 664
plastic deformation studies 674
cutting, dimensional analysis and standardization 682
liquid, crystal nuclei formation 742
electrodeposited, electron-microradiography 777, 6672
liquid, compressibilities from ultrasonic velocities 909
nuclear relaxation time 1229
rupture mechanisms 1366
deformation textures 1373, 9030, 9752
deformation, survey 1374
molecule interaction with surface 1409
strain-free cutting apparatus 1553
electron freeing accompanying atom binding 1957
mech. behaviour, Fredrickson–Eyring theory 2106
gas adsorption in catalysis 2125–6
Li resonance shift, and in non-metallic compd. 2524, 4256
electronic interactions, screening 2652
metallic behaviour of $MoSi_2$ 2683
Li cohesive energy 2880
Metals—*contd.*
electron microscopy replica techniques 3082
plastic deformation, theory 3097
dry friction rel. to temp., 4·2°K–600°K 3107, 6519
examination under polarized light 3465, 4302–3
hard metals, bond structure 3680
fundamentals of cold working 3829
interatomic distances in CO_2Al_9 3927
entropies of melting 4336
transition, d shells interactions 4616
nonclassical reaction kinetics 4806
crystals, shaping method 4893
free electron, surface energy calc. 5628
electrodeposited, structure 5810
grain boundary diffusion 5813
plastic flow, plasticine models 5830
atom vibrations rel. to heat of fusion 5632
fatigue mech. theory 5834
creep mechanism and boundary micro-flow 5839
electric fluctuation levels after tempering 6207
liquid, surface tension 6064
high press. effect on elec. resist. 6230
widened lattice interval hypothesis 6486
annealing, reaction rate theory 6488
weld metal, electron microscope exam. 6499
plastic deformation in surface-active media 6511
creep, theory 6515
gas adsorption, room-temp. 6541
heat conduction, eq. 6919
structure theory, linear atom-chains 7143
non-equilib. no. of vacancies 7384
metal physics progress, coll. papers 7439
thermal expansion/m.p. relation 7808
elec. conduction, "internal size-effect" 7850
resistance, θ values theory 7902
fatigue, X-ray exam. 8271
resist. to deformation at 10^{-6}–10^2 m/sec 8275
clean, friction 8278
plasma oscillations 8851
intergrain matter, grain boundary texture 9011
surface tension formulae 9308
alkali, light absorption 9626
dislocations theory of mech. props. 9748
Meteorological instruments see also *Anemometers*; *Barometers*; *Hygrometers*; *Ionosphere measuring apparatus*
electrical anemometers development 759, 9195
wind and gust-measuring instr. 760, 9196
ship true wind vel., elec. method 1533, 9197
airborne radar precipitation observation 1542
electrical, for building research 2195, 9191
radar-sonde system for upper air 2196, 9192
Pt resist. thermom., radiation effect 2198
mean-wind-velocity det., 2199, 9198
upper-air hygrometer 2200, 9200
review, bibliog. 3965
constant-level balloons 3966
fully electric radiosonde 3967
recording raingauge 3970
radiosonde, radiation error calc. 3971
radioactive, telemetering snow gauge 4915
"electrical nose" for atmos. aerosols 4916
sky light photometry 4917
radiosonde errors, rel.to cosmic-ray var. 6308
geomag. field amplifier 6611
atmos. elec. field strengths recording 6650
atmos. elec., high and variable resist. meas. 6652
Helsinki gas thermom. 7820
balloon-borne rain-content meter 8374
portable electrometer, radiosonde appl. 8375
improved Bellani pyranometer 9193
infrared radiation 9194
raindrop spectrograph 9201
Meteors
stream age determination 26
stream particles, mutual influence 26
counterglow photographic isophotes 27
counterglow, meteoric hypothesis rejected 28
stream formation 29
growth of stars by accretion 58
upper air wind study 763
radar echoes, review 792
Bečvář's stream (1949) 802

A complete list of the Subject Headings will be found at the end of the Index.

Meteors—*contd.*
  deceleration, ionizing efficiency 2324
  tracks drift 2325
  meteorites origin 3274–5
  micro-meteorites theory, isothermal atmos. 3278*
  upper atmos., ionization 4952
  velocities from radio observations 5018
  micrometeorites theory, heterothermal atmos. 5019
  meteorics, ballistic contrib. 5985
  visual data correl. with radar 5986
  radar echoes, interpret. 5987
  radiowaves reflection 5988
  radiants delineation, radio echo app. 5989
  upper atmos. exploration 6625
  mass-loss rate theory 6683
  Boötids velocity by radiant drift 6684
  and comets, physical relations 6685
  ionized trails, radio reflections, theory 7132
  meteorites, interplanetary matter classification 7459
  effect on cosmic-ray intensity 8006
  photoelectric observations 8441
  plasma oscillations in meteor trails 8449
  zodiacal light, p.e. study 9238
Methane
  CO_2/CH_4, N_2/CH_4 thermal diffusion coeff. pressure dependence 896
  dissociation processes, critical potentials 1139
  self-diffusion, temp. dependence 2455
  thermal conductivity at 0°c 2602
  mass spectra of *d*-methanes 5505
  reaction with D on Ni catalysts 7344
  abundance and vert. distrib. in atmos. 7405
  magnetic rotatory power 8073
Methyl alcohol
  dissociation processes, critical potentials 1139
  dielectric permittivity 6199
Methyl fluoride
  2nd and 3rd virial coefficients 9338
Mica
  magnetic properties 3637
  bent-crystal technique 4419
  in i.r. reflection spectroscopy 5270
Micrometry see also *Interferometry*; *Strain gauges*; *Thickness measurement*
  1/10 inch range, 10^{-6} inch 6765
  with inductive pick-ups 6766
  calibration device 7576
Microphones see also *Acoustic transducers*
  single-diaphragm, noise-cancelling 157, 6087
  properties in architectural acoustics 1707
  acoustics textbook 4180
  ultrasonic, reflection and pick-up effects 5213
Microscopes see also *Electron microscopes*
  a high-low temp. stage 245
  objectives, lens centering 246
  resolution, effect of condenser 247
  interferometer, new type 1785
  low-temperature stage 1786
  flying-spot scanning device 3473
  interferometer, for opaque objects 4319
  interference, for transmitted or reflected light 6159
  use of coated optics 6915
  X-ray shadow 7930
  combined stage and focus control 8669
  interference apparatus for conversion to phase contrast 8671
  multiple slit type 9410
 phase-contrast
  extension of Toraldo's theory 1007
  colour systems 2594
  conversion units for ordinary microscope 3472
  image formation theory 3475
  interference microscope theory 4320
  edge effect 4321
  high-speed, cine-micrography 4322
  transparent objects with gradual phase var. 6916
  interference filter phase plate appl. 7779
  interference apparatus for conversion 8671
 reflecting
  i.r. microspectrometer 179
  using spherical mirrors 4318
  3-mirror, design theory 5343
  spherical Schwarzschild objectives, aberrations 5344

Microscopes—*contd.*
 reflecting—*contd.*
  X-ray 7002
  u.v. and i.r. microspectrography 7662
  living and fixed cells, microspectroscopy 7663
  0·8 N.A., i.r. microspectrometry 7666
  polychromatic, u.v., 1·3 N.A. 7796
Microscopy
  absorption, luminescence of micro-objects at low temp. 193
  2-dimensional coloured Schlieren apparatus, appl. 1003
  polarizing, equipt. for −130 to +35°c 1006
  meas. of inaccessible dimensions 1632
  black and white hologram 1770
  glass surface polish, phase-contrast invest. 2595*
  metallographic-phase, contrast conversion unit 3472
  flying-spot scanning 3473
  diffraction, unwanted image elimination 3474
  micromanipulator and microdissector 3476
  high-speed cine-micrography 4322
  tissue replicas prep. 4323
  microtome knife sharpening 4324
  interference, new method 5342
  emulsion scanning mechanism 5731
  phase-contrast methods and birefringence 6160
  phase-contrast, biol. appl., review 6655
  2-step wave front reconstruction 6909
  microspectrography 7661
  crystals uni-molec. steps, observation 8344
  colour photomicrography 8418
  phase-contrast, bright-field and polarizing combined 8670
  conversion to phase-contrast 8671
  visual, u.v. and i.r., in cytology, review 8672
  image formation outside focal plane 9360
  photomicrography, shadow-casting method 9411
  high-res. radioautography 9897
Microseisms
  nature and cause 3217–8
  Rayleigh waves in 2-layer medium, appl. 3951
  generation, thermic factor 6608
  analysis of Uppsala records 7396
  rel. to cold fronts 7397
Microwave spectra see *Spectra, radio-wave*
Microwave spectrometers see *Spectrometers, microwave*
Milky Way see also *Cosmic radiations, r.f.*
  rotational relaxation time 44
  radio noise, review 792
  r.f. observations of structure 798
  brightness fluctuations and interstellar matter 2344–5
  stellar dynamics appl. 2346
  dist. and origin of hot giants 2347
  mass estimate 2349
  stellar statistics 3287
  pole det. at 205 Mc/s 3291
  differential effect of rotation 5999
  gravitational potential 6000
  origin and propagation of cosmic rays 6679
  radio noise, cosmic-ray protons as source 8447
  brightness fluctuations theory 8471
  infra-red luminosity 8472
  visibility corridors and regional differences 8473
Mineralogy
  labradorite structure and iridescence 733
  plagioclase felspars, X-ray diffraction 2183
Mirages see *Atmospheric optics*
Mirrors see also *Microscopes, reflecting*; *Telescopes, astronomical*
  parabolic, acoustic waves 1678
  TiO_2 for interferometers 2579
  pinhole-free Ag, prep. 3477
  adj. curv., for X-ray microscope 7002
 geometrical optics
  combinations of concave mirrors 5233
  3-mirror combination without coma or sph. aberration 7658
Moisture see also *Atmosphere, humidity*; *Humidity*; *Permeability, mechanical*
  thermal method, new apparatus 4879
  drying by evaporation *in vacuo* 5352
  dielectric meas. method, indust. appl. 7840

Molecular beams
- $K^{39}F$ spectrum, electric resonance method 195
- H_2 r.f. spectrum study 203
- electric resonance method molecule invest. 643
- line shape, diatomic case 3794
- free radicals, low temp. bolometer detection 4578
- focusing by non-uniform mag. field 5801
- motion in exponential mag. field 5802
- high-intensity source 5803–4
- new resonance method for H_2 and D_2 r.f. spectra 8105
- detection by condensate conductivity change 8996–7
- diffraction fringe system 8998
- paraffin, diffraction patterns? 9726

Molecular relaxation see *Molecules, relaxation*

Molecular volume
- sigma phenomenon 6083
- D_2O, 20°–100°c 7585
- hydrocarbons, rel. to acoustic vel. 9313

Molecular weight
- polystyrene in soln. 1439
- polyacrylic acid, by light scattering 5892

Molecular weight determination
- spectrophotometric, macromolecules in solution 709
- polystyrene, light-scattering and osmometric methods 1776
- polymers, photoelectric light-scattering photometer 1777
- polymers, by light scattering 2587–8
- solution and solvent refractive index differences effect 2589
- by vapour density det. 6172

Molecules see also *Kinetic theory*; *Spectra*
- identical, quantum-mechanical resonance 720, 3169
- single, electron microscope visibility 1101
- assoc. due to lone-pair electrons 2432
- H and D collision cross-sections 2758
- atomic arrangements 2879
- intermol. forces, benzene, ammonia 2889, 4579
- collision theory, *N*-body Schrödinger eq. 2891
- strong electric fields, effect on stability 3131
- methane, 2nd virial coeff. and van der Waals force 3403
- Raman spectra interaction phenomena, organic liquids 3460
- annelation energy in aromatic resonance energies calc. 3690
- square-well interaction potl. 4173
- pressure broadening, statistical theory 4244
- NaLi, existence invest. 4266
- ice lattice energy and water vap. 2nd virial coeff. 4571
- van der Waals forces in potl. functions 4582
- symmetry rel. to vibrational freq. 4586
- catalysis in protein-like systems 4835
- cohesion and polymerization rel. to sp. heat 4875
- additive molecular properties 4876
- swarms theory, liquids, consequences 5157
- macromol. solns., viscosity rel. to conc. 5163
- polyatomic, entropy and enthalpy calc. 5376
- quantum-mechanical model, molecular chains 5638
- distrib. functions, integral eq. 5643
- CF_4, SF_6, CO_2, intermolec. potentials 6789
- inter- and intra-molecular association, effect on i.r. spectrum 6853
- ammonium, theory 7156
- pressure-induced absorption 7174
- long-chain, dispersion of irregular configurations 7571
- statistics of linear paramagnetic macromolecule 8038
- free valence defn. on Penney bond orders basis 8086
- CH_3Cl intermolec. forces 8092
- molecular energy at high pressures 8585
- He_2 formation in glow 8623
- polyatomic, law of corresponding states 8709
- extent of many particle problem 8870
- CH_3F molecular interactions 9338
- X-ray absorption spectra, theory 9513–15

dimensions
- H_2 internuclear distance 529
- macromolecules in soln. spectrophotometric det. 709
- methylenic chains, statistical radius 1224
- methyl acetylene 2527
- NOCl and NOBr 2541
- CH_3CF_3, C–F distance 2546

Molecules—*contd.*

dimensions—*contd.*
- isocyanic acid 2547
- osmotic meas. 2903
- isothiocyanic acid 2905
- M_6X_{12} groups, interatomic distances, by X-ray diffract. 2907
- F_2O i.r. spectrum new meas. 4251
- GeF_3Cl 4270
- trifluoromethyl acetylene 4271
- electron diff. study, thin silicone films 4590
- polymer coils, dipole moment det. 5642
- diameters from Sutherland's const. 5645
- polyacrylic acid, by light scattering 5892
- C_2H_4O, C_2H_4S 6126
- conjugated, bond lengths 6380, 7160, 7163
- turbidities expressions appl. 6902
- trifluorosilane derivs. 7175
- viruses, by X-ray scattering 7426
- Br_2, dia., from visible absorpt. band studies 7691
- microwave spectroscopy appl. 7744
- F_2, from Raman spectrum 8110
- macromolecules in solution 8564–5
- $Cs^{133}Cl^{35}$ 8642
- from flow birefringence data 8664
- N_2, CF_4, CH_4 by neutron diffraction 9007
- polystyrene apparent specific vol. in soln. 9097
- sarcosine polymers 9098

dissociation see also *Heat of dissociation*
- N_2, rel. to afterglow 527
- C–Br bond, organic bromides 535
- ditto, aromatic substitution effect 5888
- ditto, substituted benzyl bromides 9794
- ditto, halogenated bromomethanes 9795
- C_2N_2, HCN, CClN, by electron impact 1135
- fast H_2^+ cross-section 1136
- thiophenol 2884
- C–Br bond in trichlorobromoethane 2902
- isotope effect shown in mass spectra 2934
- bond dissociation-energies variations 3170
- HCl theory, additions 4580
- C, N, O, H compds., bond energies 4869
- bromomethanes, halogenation effect 5887
- heterolytic, conjugation influence 6523
- bond dissociation energies det. 6548
- IF and BrF, emission spectra 6845
- NH, exptl. value 6846
- methylene, first C–H dissoc. energy 6934
- NH_4 (erratum) 7156
- gaseous diatomic oxides 7328
- Cd^{++} vacancy complex and NaCl double vacancy 7380
- short-life substances, absorpt. spectra 7697
- N_2, and predissociation 8624
- C–H, C–C bonds in organic molecules 9629

excitation
- N_2, $C^3\pi u$ state 2520
- C_2 Swan bands, critical press. effect 2551
- phosphor energy absorption theory 2555
- gas relaxation time interpretation 4578
- NO, in glow discharges 4589
- molecular crystals 4902
- C_2 bands in Kr 5257
- N excitation in Na arc 6106
- excited triplet states 6119
- oscillatory state duration, spectrophone det. 7146
- CS_2, ultrasonic absorption 7631
- dissociative electron-ion recombination 7981
- O_2 in oxy-hydrogen flame 8287
- carbonium ions, lack of resonance energy 8882

internal mechanics
- $X_2Y_2X_2$ model, vibration-rotation energies 528
- non-adjacent atoms, links 534
- molecular vibrations and chemical reactivity 536
- bond localization energy 719
- molecular-orbital theory, dyes 726
- homopolar, diatomic molecules, i.r. absorption 954
- pyramidal mol., vibration potential function 1213
- 2*s* and 2*p* electron interaction integrals 1218*
- force constant matrix 1219
- oscillator contrib. to thermodynamic functions 1221
- centimetric absorption phenomena 1471
- hindered rotator X-ray scattering 1491

A complete list of the Subject Headings will be found at the end of the Index.

- **Molecules**—*contd.*
  - **internal mechanics**—*contd.*
    - overlap integrals and chemical binding 2147
    - effect of solvent on Raman spectra 2566
    - inner electron distrib. asymmetry 2890
    - *N*-particle Schrödinger eq., rotat. coors. 2891
    - diatomic infrared bands (erratum) 2895
    - dodecahedral octacovalent bond orbitals 2898
    - $C = O$ vibration freq., i.r.-absorption and Raman comparison 3440
    - dipolar radiations, anomalous decay time 3682
    - structure as equiv. orbitals 3684
    - equiv. orbitals, ionization potentials calc. 3685
    - consonant electron systems 3692
    - orbitals form in conjug. rings and chains 4576
    - spectroscopic moment, substituent groups parameter 4577
    - vibrational assignments aid to calc. 4581
    - orthogonal atomic orbitals 4585
    - vibrational freq. changes calc. 4586
    - hybridization and resonance 4591
    - l.f. Raman lines origin, organic crystals 5304
    - Sutherland's model 5645
    - sp_3-hybridization valence orbitals calc. 5650
    - tripyramidal bond orbitals 5651
    - waves and oscill. in inhomog. discrete structures 6079
    - Raman rotatory spectra, line width 6137
    - XYZ_3 rotation hyperfine structure 6377
    - covalency, electrovalency and electronegativity 6379
    - entropy calc. from spectroscopic data 6383
    - π-bonds interaction intensity 6547
    - two-quantum transition, source of extra line group 6849
    - polyatomic molecules, vibrations det. 7145
    - theory, integrals calc. 3252, 7148
    - 2*s*, 2*p* hybrid orbitals, overlap and bonding power 7152
    - electronegativity scale, force constants and ionization potential 7157*
    - ionic character of bonds 7158
    - ionic-homopolar resonance 7159
    - energies and bond lengths, conjug. molecules 7160
    - π-bonds order/length rel., heteronuclear molec. 7161
    - LCAO orbital schemes and resonance energies 7168
    - orthonormal sets of LCAO orbitals, 2nd-row diatomic 7169
    - overlap average and central field approx. 7170
    - forbidden octavalent structure 7172
    - torsional oscillator, theory 7562
    - perturbations in band spectra 7672
    - complex molec. energy transfer 7687
    - natural hypsochromic shifts 7696
    - dispersion theory, molec. crystals 7722
    - microwave spectroscopy appl. 7744
    - torsional vibrations and photoluminescence polarization 7764
    - coloured addition compds. 7795
    - symmetric, anomalies in microwave spectra 8085
    - Thomas–Fermi eq., soln. for axial symmetry 8087
    - linear molec. kinetic energy matrix 8097
    - atomic polarizabilities variation in vibrations 8098
    - axially symm., *l*-type doubling 8102
    - configuration interaction effect on dipole and transition moments 8107
    - interaction intensity in C–C bonds 8318
    - isotopic molec., freq. rel. 8628
    - approx. wave functions satisfying virial theorem 8873
    - diamag. anisotropy org. molecules, calc. 8875
    - asymmetric top, partition function 8878
    - linear triatomic, parallel vibrations 8880
    - vibrations, associated wavelengths 8998
    - linear and angular mol. bond-bond interactions 9094
    - isostere structures comparison 9627
    - S_2 band-spectrum perturbations 187
    - S_8, S_2Cl_2, P_4 (erratum) 4260
    - P_2, u.v. band system rotational structure 1727
    - P_2 u.v. bands, perturbations 1728
    - H_2 polarizability, calc. 529, 9628
    - H_2, new calculation 1214
    - H_2 magnetic shielding const. 1963
    - H_2 stability, homopolar bond theory 2896
    - H_2^+ hybrid bonds 5641
    - H_2, cellular method calc. 6374

- **Molecules**—*contd.*
  - **internal mechanics**—*contd.*
    - H_2^+ $1s\sigma$–$2p\sigma$ oscillator strength 8877
    - H_2 electronic energy calc. 8879
    - HD, rotation-vibration spectrum 204
    - H_3 orbital calc. 5648
    - H_4 molecular orbitals 3683
    - $(He^3)_2$ rotation and vibrational constants 947
    - HOCl and DOCl, force constants 5284
    - SiH_4 theory 533
    - N derivs., orbital theory 1216
    - isotopic N_2O molecules 2540
    - N_2O vibration absorption band intensity 7751
    - C–NO_2 link rotativity 3688
    - NH free radical studies 6846
    - NH_3 inversion line pressure broadening 2904
    - NH_3 and ND_3 vibrational spectra 6382
    - NH_4^+ (erratum) 7156
    - NOCl microwave spectra 6870
    - OH radicals, vibrational transitions 1392
    - BrCN, ICN, centrifugal distortion constants 1735
    - H_2S, vibrational energy 1744
    - HDS, centrifugal distortion 8101
    - CaO vibrational and rotational constants 3437
    - trihalide ions, bonding, molec. orbital treatment 4867
    - triborine triamine, out-of-plane H vibr. 5647
    - $POCl_2F$, etc., resonance lines splitting 6066
    - KHF_2 asymm. valency vibration 6124*
    - OCS, CS_2 stretching vibrations 7694
    - C and Si tetrafluorides, force fields 8090, 8881
    - solid Cl quadrupole spectrum 8091
    - quadrupole transition, O_2 auroral afterglow 537
    - O_3, force const., freq. assign., thermodynam. props. 8099
    - alkali halides, binding energy, dipole moment 8108
    - alkali halide α- and β-bands oscillator strengths 8635
    - BS 8625
    - ClF infrared spectrum analysis 8645
    - alcohols, solid, rotation 2642
    - large aromatic systems 3641
    - organic, isoconjugate spectra and variconjugate seq. 4575
    - dichroism peculiarity aromatic compds. 6132
    - electron density theoret. det., organic molecules 8876
    - CH, CH_2 and CH_3 valency vibrations 1734
    - CH bond absorption freq. and perturbations 9372
    - CH, ${}^2\Pi - {}^2\Delta$ osc. strength 9630
    - HCCCl and DCCCl, force constants 960
    - C_2D_2 vibration-rotation transitions 7745
    - COS, C_2H_2 vibrations 7753
    - diacetylene vibration spectrum and force const. 3687
    - $C = O$ vibrations in ketones 9632
    - formic acid and formate ion, potl. function 8317
    - methylfluoroform, internal rotation barrier 1225
    - asymm. top, centrifugal distortion, $H_2C^{12}O$ 7154
    - CH_4 i.r. absorption band, effect of h.p. foreign gases 4278
    - subs. methanes force constants 3173, 6375, 7735
    - ditto, centrifugal distortion 1735
    - methane and related molecules, continuous spectrum, theory 8630
    - methyl cyanide, i.r. rotation-vibration spectrum 4249
    - methyl groups, in Cd dimethyl, internal rotation 7166
    - Zn and Hg dimethyl, internal rotation 7704
    - ethane, normal modes 1743
    - 1, 2-dihalogenoethanes, lattice frequencies 1755
    - CD_3–CD_2H, vibration modes 2569
    - tetrafluoroethylene fundamental frequencies 1757
    - ethylene, planar vibrations, potential function 2892
    - tetrachloroethylenene, vibrational assign. and thermodynam. functions 2897
    - 1 : 1-dichloroethylene, Cl atoms repulsion 3447
    - subst. ethylenes and rel. compds., non-planar vibrations 3691
    - CH_2 vibrational freq., *n*-paraffins 4252
    - nuclear resonance in solid hydrocarbons 7164
    - diazines, from u.v. spectra 6865
    - para-di-chloro-benzene 2563
    - cyclohexane vibration freq. calc. 2894, 3439
    - methylchlorosilanes, normal co-ord. treatment 975
    - sulphone conjugation 3880
    - tropolone, vibration freq. 4261
    - long CH_2 chain, polythene 6378

A complete list of the Subject Headings will be found at the end of the Index.

Molecules—*contd.*
- **internal mechanics**—*contd.*
  - linear polyenes, potential energy functions 1223
  - orbital coeffs. eval., polene chain derivs. 8094
  - cyclic polyenes 8095
  - **energy levels**
    - diatomic molecules, electric resonance methods 643
    - diatomic, from spectra, textbook 2502
    - long molecules, asymptotic expressions 2882
    - molecular crystals 4902
    - configuration interaction 5640
    - hybrid orbitals for co-ord. nos. 7 and 9 6381
    - discrete levels assoc. with Lennard–Jones potl. 7153
    - rotational constants from perturbation data 7673
    - 2-centre integrals with 2*s* and 2*p* functions 8089
    - diatomic symmetrical molec., transition prob. 8096
    - complex molecules, electronic transitions characterization 8103
    - modified wave function distortion process 9631
    - BaO band-spectrum 188
    - ZrO band-spectrum 189
    - NO, new $^2\Sigma$–$^2\Sigma$ systems 946
    - Zeeman effect in O_2, calc. 1960
    - N_2O, rotational constants 2548
    - N_2, C_2 oscillator strengths 2893
    - Mn ammonium sulphate 3638
    - PH_2D, AsH_2D, SbH_2D 4269
    - CO_2 ground state, LCAO field calc. 4587
    - N_2^+, rel. transition probabilities calc. 5261
    - H_2O, CO_2 from i.r. spectra 5283
    - B_2 and Na_2, transitions, oscillator strengths calc. 7165
    - C_2 electron states 8088
    - H_2 and D_2 r.f. spectra, new molec. beam resonance method 8105
    - D_2O 9633
    - organic molecular orbital predictions 530–1
    - aromatic hydrocarbons, u.v. absorption rel. to reduction potential 955
    - *cis*- and *trans*-1, 3-butadiene, *SCF* calc. 1215
    - Franck–Condon freq. in unsat. hydrocarbons 1217
    - methyl silane, internal rotation 2526
    - methyl acetylene 2527
    - isocyanic acid 2547
    - monosubstituted benzenes, resonance effect 2883
    - thiophenol ionization energies 2884
    - $(C_6H_5)_2X$-type compds. 2885
    - phenyl halides, inductive effect 2886
    - styrene, phenylacetylene and phenylcyclo-propane and -alkane 2887–8
    - benzene, orbital calculations 2901
    - allene twisting freq. and π-electron levels calc. 4588
    - butadiene, electronic levels 5639
    - dichloroethylene and methylbromide, transition energy difference calc. 7147
    - naphthalene, transitions 7717
    - polymethine molec., metallic model, u.v. spectrum appl. 7720
    - polyacenes, electronic levels 8093
    - aromatic hydrocarbons low excited states 8104
    - A_{1g}–E_{1g} transition in benzene 8874
  - **nuclear coupling** see also *Spin-lattice coupling*
    - effect on spectra, review 1253
    - from molecular beam line shape 3794
    - diatomic, binding regions 4584
    - time average mag. field at nucleus 4613
    - O_2, microwave spectrum invest. of O^{18} spin 5282
    - magnetic shielding of nuclei 7149
    - ditto, dependence on orientation 8100
    - quadrupole, interpretation 7150
    - trifluorosilane derivs. 7175
    - $LiSO_4$ proton resonance 9634
- **moments**
  - HD 204
  - $EtNH_2$, Et_2NH, Et_3N, dependence on state 1036
  - meas., solvent effects 1037
  - N_2 quadrupole moment, rel. to ionic mobility 1144
  - D_2 radiofrequency spectrum, magnetic field 1740
  - metallic oxymethylenecamphor complexes 1781
  - hydrazoic acid 1961
  - CH_3CF_3, moment of inertia 2546
  - isocyanic acid, moment of inertia 2547
  - dipole, ethylene oxide and carbonyl chloride in benzene 2900

Molecules—*contd.*
- **moments**—*contd.*
  - NH_3 quadrupole-induced dipole interactions 2904
  - isothiocyanic acid, dipole moment 2905, 7173
  - rotational, magnetic, in polyatomic molecules 3686
  - MnO, O mag. moments ordering 3948
  - SO_2 dipole moment, microwave invest. 4247
  - O_2 quadrupole, from microwave spectrum 4248
  - A_3H_3 and SbH_3, electric dipole 4269
  - dipole, heterocyclic comp. calc. 4583
  - dipole matrix elements ratio, rel. to absorption intensities 5278
  - quadrupole, benzene, ethylene, etc., microwave spectra det. 5281
  - electric, polar polymers, rel. to struct. 5642
  - HNCO, HNCS, dipole and electric quadrupole 5644
  - OCS, HNCO, H_2CO, CHF_3 dipole moments etc. 5649
  - C_2H_4O, C_2H_4S from microwave spectra 6126
  - anisotropic media opt. activity theory 6154
  - ferroelectrics, dipole moments 6197–8
  - associating liquids, dipole moments 6199
  - $CuCl_2.2H_2O$, magnetic moment, rel. to ext. field 6346
  - pressure broadening and microwave spectra 6850
  - magnetic, by microwave Zeeman effect 7155
  - ionic-homopolar resonance 7159
  - dipole moment and ionic character 7167
  - alkyl polysulphides, dipole 7171
  - microwave spectroscopy appl. 7744
  - dipole, calc. halogen hydrides, ionization degree 8106
  - dipole and transition, configurational interaction effect 8107
  - alkali halides, binding energy and dipole moment 8108
  - methyl mercaptan 8641
  - $Cs^{133}Cl^{35}$ 8642
  - dipole, var. with state, for *n*-propyl- and *n*-butylamines 8883
  - electric dipole moment computation 8884
  - nitrosyl fluoride 8885
  - calc. from sound velocity 9315
  - dipole moment tables, and beat-frequency meas. method 9442
- **physical structure** see also *Bonds*; *Chemical structures*; *Crystal structure, molecular*
  - equiv. orbitals description 3684
  - Lewis acids and bases, complexes 5646
  - short-life subst., absorption spectroscopy 7697
  - rel. to acoustic velocity in liquids 9314
  - changes during chem. reactions 9767
  - **inorganic**
    - NO, u.v. absorption spectrum 200
    - N_2O_4, theoretical study 1962
    - nitrosyl chloride from microwave spectrum 2533
    - isothiocyanic acid 2905–6, 7173
    - HNCO, HNCS, quadrupole coupling const. evidence 5644
    - HNCO, i.r. spectrum 7748
    - $PtBr_6^{--}$, $PtCl_6^{--}$, $Nb_6Cl_{12}^{++}$, $Ta_6Br_{12}^{++}$ and $Ta_6Cl_{12}^{++}$, by X-ray diffract. in soln. 2907
    - H_2O_2 3689
    - S_8, S_2Cl_2, P_4 (erratum) 4260
    - GeF_3Cl 4270
    - S vapour dissoc. invest. 5855
    - trifluorosilane derivs. 7175
    - ND_4Cl, by neutron diffraction 7394
    - tetramethyldiborane 7771
    - N_2, by neutron diffraction 9007
    - isostere structures comparison 9627
    - $Li_2SO_4.H_2O$, nucl. mag. reson. study 9634
  - **organic**
    - proteins, polypeptide chains 526
    - polystyrene, group structure rel. to crazing 653
    - polymers, segment distribn. round c. of g. 721
    - dyes, structure and colour 726
    - nitrocelluloses, intrinsic viscosity and mol. wt. 727
    - naphthalene, vibration spectrum 1222
    - protein molecules, X-ray scattering invest. 1227
    - hydrazoic acid 1961
    - CH_3Br 1964
    - tetramethylorthosilicate, hexamethyldisiloxane and hexachlorodisiloxane 2085
    - thiophthen, central bond length 2184, 3881

Molecules—*contd.*
  physical structure—*contd.*
    organic—*contd.*
    methyl acetylene 2527
    1, 2-dihalogenoethanes rotational isomer theory 2908
    synthetic polypeptides 3171–2, 5889
    hydrocarbons and fluorocarbons 3486
    methyl acetylene 4274
    substitutents effect on double bond conjug. 4296
    conjug. rings and chains, orbitals form 4576
    fibrous proteins, i.r. study 5271
    hydrocarbons, C=C bond, characteristic freq. 6120
    C_2H_4O, C_2H_4S from microwave spectra 6126
    rubber-like matls., chain network 6549
    quinhydrone type compds. 6551
    bond-length prediction, naphthalene, anthracene 7162
    nuclear resonance in solid hydrocarbons 7164
    alkyl polysulphides 7171
    unimerism 7360
    benzene/oxalyl chloride, complexes formation 7699
    large molecules, i.r. spectra interpretation 7708
    polypeptides and protein i.r. spectrum invest. 7725
    polyisoprenes, polarized i.r. invest. 7727
    rubber derivs., i.r. analysis 7728
    globular protein, i.r. spectroscopic studies 7730
    chitin, i.r. and X-ray studies 7732
    proteins polarized u.v. 7733*
    cyclic polyenes 8095
    carboxyl group studies 8316
    polypeptide chains, new X-ray evidence 8362
    CF_4, CH_4, by neutron diffraction 9007
    acetyl halides 9023
    clathrate compounds 9095
    acraldehyde, crotonaldehyde 9096
    benzene and nitrobenzene in CCl_4, opt. anisotropy 9402
  relaxation see also *Acoustic wave propagation*; *Dielectrics*; *Liquids, theory*; *Magnetic relaxation*; *Nuclear magnetic resonance*; *Paramagnetic resonance absorption*
    acetylene derivs., adiabatic compressibility 118
    paramagnetic relaxation effects 497
    dielectric, liquids and solids, microwave meas. 1043
    organic vapours, ultrasonic dispersion 1672
    glycerine dielectric polarization 1819
    absorption in β-brass near Curie point 2466
    Na-liq. NH_3 solns. studies 4156
    N_2, shock front thicknesses and heat capacity lags 4184
    gas relaxation time meas., interpretation 4578
    polar chain molecules in pure liquid 5397
    benzene, acoustic meas. 6078
    glass relaxation spectrum 6804
Molybdenite
    prismatic cleavage 1489
Molybdenum
    secondary electron emission 1319, 7018
    high-temp. struct. and thermal expansion 4908
    slow electron reflection coeff. 7016
    evap. film, elec. cond. 7887
    effect of deformation on elec. resistivity 9496
Molybdenum oxide
    electrical conductivity 1049
    promoted catalyst, physical properties 1399
Molybdenum silicide
    metallic behaviour, elect. resist. 2683
Monochromators see also *Filters, optical*; *Light sources*; *X-ray monochromators*
    u.v. focal monochromator 1729
    Christiansen filter, modification 3438
    new const.-dev. prism arrangement 4226
    converted Beckman IR-2 5264
    Hilger–Müller, double 5265
    for double-beam i.r. spectrometer 6103
    replica grating absorption spectrophotometer 6840
    multiple-, conversion from single- 6847
    vacuum, double, for u.v. 8626
Moon
    radio-wave echoes, review 792
    motion, rel. to radio Doppler shift 801
    nature of surface 1579
    origin theory 1578, 2321
Moon—*contd.*
    surface temp. meas. near i.r. 3273
    theory of structure 4067
    direction contraction theory 4913
    partial eclipse, brightness rel. to O_3 dist. 4918
    heat budget during lunar eclipse 5015
    influence on telluric currents 6609
Moonstones
    structure and optical behaviour 1474
Multiple stars see also *Binary stars*
    review 8467
Music see *Acoustics, musical*; *Scales, musical*
Musical instruments
    Baldwin electronic organ 1685
    new and old violins, effect of absorption 4203
    organ flue pipe voicing 4206
    acoustics of organ 5206
    Fokker's organ in Huygens' tuning 5207
Naphthalene
    molecules, evap. and mobility 6169
    bond-length prediction 7162
Navigation
    blind, Liouville's approximation appl. 59
    automatic target-seeking devices 60
    bird navigation theory 6656
Nebulae see also *Astronomical spectra*
    clusters, dynamical mass est. 2340
    gaseous, electronic temps. 2350
    planetary, radiation pressure 4057
    photoelectric photometry 5981
    NGC 7023, polarimetric invest. 7477
    planetary, ionized H regions 7478
    planetary, H^- existence 7479
    NGC 7023 diffused light polarization 7481
    Crab nebula as cosmic-ray point source 8446
    nebular clusters, mech. models 8468
    diffuse gas, special class 8469
    planetary, radiation field 8470
  extragalactic
    radio astronomy, review 23
    elliptical, structure uniformity reason 44
    radio noise, survey 1575
    r.f. radiation 1576
    total magnitudes, rel. to star magnitudes 1587
    interstellar matter photon collisions red-shift 2320
    recession, Dirac eq. appl. 2343
    stellar dynamics appl. 2346
    distance scale 4042
    abs. and app. mag. relation 4058
    photometry, Schilt method 5009
    Pleiades, possible light deviation 5038
    Magellanic clouds, transparency 5041
    S.M.C., supergiant red variables 5042
    photoelectric photometry 5981
    two-colour indices and gen. relativ. 9247
Neodymium
    atomic heat 6395
Neon
    ambipolar diffusion 350
    secondary electron emission from Mo 1319
    neutron scattering cross-section 1328
    thermal diffusion meas. 1654
    molecular and atomic ion mobilities 1891
    self-diffusion temp. dependence 2455
    stripped nuclei, in primary cosmic rays 6296
    crystal, triple-dipole interaction 6373
    magnetic rotatory power 8074
Neutrino
    scattering cross-sections limit 649
    reasons for "invention" 2800
    Be^7 decay, nuclear recoils 4644
    emission from P^{32} 4667
    electron-neutrino angular correl. 5723
    Kr^{89} decay emission 7237
    spin determined by β-ray spectra 8938
Neutron diffraction
    NH_4Cl, thermal neutrons 647
    antiferromagnetism ordering effect invest. 1921
    small-angle, by powders 2070
    graphite layers 3208
    coherent scattering amplitudes det. 4737
    in antiferromagnetism study, review 5552
    Fe_3O_4 mag. props. invest. 5568

Neutron diffraction—*contd.*
interference, dense systems 5808
by paramag. and antiferromag. subst. 7072
in Se and As microcystals 8203
D-containing compounds 8236
crystal monochromators 9006
by N_2, CF_4 and CH_4 9007
magnetic, from exchange-coupled lattices, high temp. 9733
Neutron diffraction crystallography
single-crystal analysis 3947
special applications 3948
neutron crystallography, review 5910, 9734
NH_4Cl structure invest. 7394
H positions in UH_3 9838
Neutron spectrometers
Chalk River, single crystal 646
mobile instrument 2072
Li^6 emulsion technique improvement 3055
bent-crystal spectroscopy 4412
Harwell time-of-flight type 4766
crystal monochromators 9006
Neutrons see also *Cosmic rays, neutrons*; *Nuclear reactions, neutrons*
semi-conductors, irradiation effect 315
from D on C^{13}, Q-values 614
flux modulation in pile 623
spin value 644
binding energies 1277, 4711
$N^{14}(n, p)C^{14}$, energy Qnp 1309
effect on quartz thermal conduct., low temp. 1793
deutron disinteg. calc. 2055
magnetic moment 2379
$Li^7(p, n)Be^7$ neutron spectra 2995
150 MeV, stars, hammer tracks 3006
yield and energy, photo-disint. of U 3026
150 MeV, star ang. dist. and prong-dist. 3036
from D + D, ang. distrib. 3767
ionization yields 4485
(n, γ) effects in iodobenzene 4731
(n, α) reaction in B^{10}, cross-ratio rel. to energy 4733
thermal, low-power reactor data 3785, 4745, 8214
biological effects 4973
non-electromag. reaction with electrons 5471
n–n interaction, dineutron energy 5739
autoradiography, U and Th det. in minerals 5807
n–p interaction 6034
fast, effect on Ge 6969
addition energy in $h_{11/2}$ shell 7178
radioactive decay, half-life, β-spectrum 7205
gravitational acceleration 7299
mag. moment, in electron-neutron interaction 7534
mag. mom. effect in h.f.s. calculation 7679
energy spectrum, from Th(C + C′)–Be source 8185
ang. distrib., from 20-MeV α-bombardment 8195
chem. analysis appl., survey 8325
fast, exchange collisions with deuterons 8968
β-decay 9009
neutron-capture elements formation theory 9682
from $C^{13}(\alpha, n)O^{16}$, analysis 9686
from $O^{16}(d, n)F^{17}$, ang. distrib. 9696
chem. effects on pyridine oxalate 9774
Szilard–Chalmers effect 9778–9, 9070, 3756
absorption see also *Nuclear excitation*; *Nuclear reactions, neutrons*
U fission cross-section meas. 622
Pb cross-section, rel. to energy 627
S nuclear energy levels investgn. 628
cross-sections, some elements 650, 652
M.I.T. cyclotron concrete wall transmission 1334
rel. cross-sections for Kr and Xe isotopes 2049
complete reference tables 2938
Si 3031
radiative capture in D 3032
B estimation in Pyrex 3182
fast and slow, Szilard–Chalmers yields 3756
$(n, 2n)$ and (n, p) cross-sections 3781
Am^{241-2} 4735, 4746
Sb–Be photo-neutrons, activation cross-sections 4740
low-power reactors, data 4745
capture cross-sections, rel. to level density 5782
nuclear cross-sections interpretation 5784
drill-hole logging, neutron, gamma method 6617

Neutrons—*contd.*
absorption—*contd.*
neutron-capture γ-rays from F, Na, Mg, Al, Si 8177
meas. by pile modulation 8206
capture cross-sections, 69 elements 8208
polarized neutrons, correl. phenomena 8209
polarized neutron capture, polarized γ-radiation 8948
(n, n) and (n, p) resonances in P^{31} and S^{32} 8980
Mg and Si total cross-sections, below 800 keV 8981
nD capture mechanism 8982
total cross-sections, light nuclei, for p, T neutrons 9710
Te resonances 9730
chem. effects of $Cl^{35}(\gamma, n)Cl^{34}$ in $NaClO_3$ 9776
fast
He^3 disintegration 2051
42-MeV, 33 elements 3029
Be, B, O and F cross-sections 3034
H and C, 156 ± 3 MeV 3038
slowing-down calc. 4769
variation with energy 5783
total cross-sections for Be, Al, S, Pb 2–6 MeV 5785
He total cross-section 5788
by atomic nuclei 6464
156-MeV total cross-sections, 10 elements 8207
slow
NH_4Cl, thermal 647
Mo and Br cross-sections 2052
U^{238} resonance capture 2053
pile neutron, 55 elements 2073
Mn cross-section below 5 000 eV 3035
thermal, effective cross-sections 3795
(n, α) in Fe, invest. 3779
slowed-down neutrons space-energy distrib. 4760, 6479
Br 6466
Co^{59}, thermal capture cross-section 6468
thermal neutrons on B, study 7279
Zr and Hf 7280
Se and As, thermal 8203
cross-section meas. by pile modulation 8205
detection, measurement see also *Radiation monitoring*
BF_3 proportional counters 384
slowing-down meas., In foil 1326
multiple-layer counters 1333
strength of source, meas. 2065
in photo-disintegration study for 33 elements 3020
detecting foil neutron-density depression 3053
(n, α)-type counters, operation 3585
weak fluxes comparison with organic bromides 4761
slow neutrons by radium-beryllium source 4767
scintillation counter 5496, 8798
survey of techniques 5684
$C^{12}(n, 2n)C^{11}$ in anthracene crystal 5809
slow, by LiI–TlI 6481
high energy threshold detectors 6482
small BF_3 ionization chamber 7030
scintillating liquids 7036
slow-neutron, by foils 8231, 9729
neutron sources, absolute calibration 8232
slow neutrons, survey 9728
use of cellulose sponge 9882
diffusion
injection energy effect on distribution 645
slowing-down dist., $Sb^{124}Be$ photo-neutrons in graphite 1326
penetration and slowing-down at intermediate distances 1327
in multiplying media, mean free path effect 2066
distribution in moderator 3050
spatial and energy dist. in capturing moderator 3051
diffusion length of paraffin 3052
detecting foil neutron density depression 3053
Milne's problem, max. and min. densities 3797
slow neutrons, cosmic-ray produced 4512
thermal neutrons, single scattering anisotropy 4759
thermal, spatial dist. about point source 6477
diffusion lengths in water and solutions 6478
and atomic piles theory 9005
polarization
double transmission and depolarization 3054
meas. by reflections at magnetized mirrors 4763
highly-polarized beams production 4764
capture, correlation phenomena 8209, 8948

Neutrons—*contd.*

- **production**
  - evidence for magic numbers 539
  - Be^{9}(α, n)C^{12}, energy spectrum 603
  - Li^{7}(p, n)Be^{7} energy groups 605
  - from T^{3}(p, n)He^{3} 608
  - *d–d*, angular dist. 611
  - *d* on separated Mg isotopes 612
  - fast neutrons from T + D and T + Li 615, 6459
  - 320-MeV Bremsstrahlung photo-neutron yields 617, 7267
  - 200-kV generator 1320–1
  - V^{51}(p, n)Cr^{51} and Sc^{45}(p, n)Ti^{45} 2033, 3002
  - Be proton bombardment, energy distrib. 2034, 7258
  - ditto, angular distrib. 5744
  - proton-neutron reactions and thresholds 2035
  - by proton bombardment below (p, n) threshold 2038
  - by *d* on C^{14}, spectrum 2041
  - Be and D photo-neutron thresholds 2045
  - ditto, yields 2048, 3019
  - Ag and Al photo-disintegration, ratio to protons 2047
  - neutron source strength det. 2065
  - C^{13}(p, n)N^{13} yield 2999
  - 16-MeV protons, Be, Al, Fe, Rh, Au, Tl, neutron spectra 3003
  - high-energy, from deuterons on C^{13} 3011
  - photoneutron cross-sections 3021
  - photoneutron thresholds 3771
  - by deuteron photodisintegration, ang. dist. 3773
  - number per thermal U fission 3785
  - fission, delay times 3786
  - by cosmic rays, review 4516
  - (α, n) and (d, n), ang. dist. 4694
  - deuteron- and alpha-bombardment, thick target 4698
  - high-energy, by 330-MeV protons, ang. distrib. 4702
  - high-energy, yields from *p* and *d* bombardment 4705
  - slow, by radium-beryllium source 4767
  - in ice by cosmic rays 5542
  - meson stoppage in Pb 5737
  - by high-energy protons 5743
  - Mn^{55}(p, n) spectrum 5753
  - neutron-gamma-ray correl., Li^{7} deuteron disint. 5754
  - deuterons on Be, angular distrib. 5755
  - Fe^{54}, Ni^{58}, Zn^{64} photoneutron cross-sections 5770
  - photoneutron yields, interpretation 5771
  - fast, from Ra–Be source, primary spectrum 5805*
  - U^{238} photoneutron threshold 6462
  - 800-kV generator, Istanbul 6480
  - rotating Li target 7022
  - energy distrib. in proton bombardment of C 7258
  - 15-MeV (d, n) reactions, ang. distrib. 8194
  - absolute calibration of neutron sources 8232
  - low-energy thresholds in presence of fast neutrons 8959
  - neutron thresholds, light elements 8969
  - O^{16} + D, low states 8970
  - thick target yields from (d, n) at 10 MeV 9008
  - 200 kV D + D generator 9010
  - yield from protons on Cl 9692
  - (d, n) reactions in light elements, ang. distrib. 9697
  - Li^{9} as new delayed emitter 9732
- **reflection**
  - from magnetized mirrors 4763–4
- **refraction**
  - in ferromagnets 2071
  - index in ferromag. materials 4763
  - formulae for index 7296
- **scattering**
  - He^{5} lower levels invest. 544
  - Fe (n, α) reaction, slow neutrons 620
  - 4·5- and 5·5-MeV *n–d* scattering 648
  - cross-sections at 120 and 345 eV 651
  - bound scattering amplitude data 1232
  - nuclear field invest. 1241
  - nuclear radius in Breit–Wigner formula 1242
  - deuteron scattering lengths 1322, 3796
  - by O, C and N, ang. dist. 1323
  - fast neutrons by C and O 1324
  - Li resonances 1325
  - noble gases, cross-sections 1328
  - nuclear cross-sections for 280 MeV neutrons 1329–30
  - slow, by solid and liquid He 1331
  - inelastic, by deuterons 1332

Neutrons—*contd.*

- **scattering**—*contd.*
  - by Na^{23}, spin-dependence 2067
  - and polarization in Fe single crystal 2069
  - small-angle, by powders 2070
  - mag. field refractive index 2071
  - complete reference tables 2938
  - 3·1 MeV, forward, by deuterons 3008
  - H and C cross-sections 3030
  - high-energy, transparent nucleus model 3033
  - Mn cross-section below 5 000 eV 3035
  - 14-MeV, by tritons, ang. dist. 3037
  - proton binding invest. 3693
  - 4·87 eV Au resonance 3777
  - elastic, by light nuclei, dispersion formula 3778
  - 14 MeV, total cross-sections 3780
  - resonance, review 3782
  - U, thermal cross-section 3785, 4745, 8214
  - by deuterons, theory 3798
  - neutron-deuteron, v. low energies 4101
  - D–D, by atomic nuclei 4727
  - interaction cross-sections, sphere method 4728
  - fast, interaction with Bi, Pb, Tl and Hg 4729
  - thermal neutrons, 12 elements 4730
  - coherent amplitudes det. 4737
  - 15-MeV, inelastic, by Pb, Fe and Al 4741
  - polarization by reflection 4764
  - *n–d*, high-energy 4765
  - from C, paraffin and P, depolarization 4768
  - slowing-down calc. 4769
  - inelastic, shell structure data 5780
  - C total cross-section 5786
  - inelastic collisions in Pb 5805*
  - by ferromag. crystals 5806
  - dense systems, interference 5808
  - total cross-section 39–156 MeV 5786
  - thermal, by Hg 6483
  - 3 MeV, by *d*, cloud chamber study 6484
  - fast, inelastic 7281
  - *m–n*, deduction from *m–d* 7291
  - coherent, V^{51} 7297
  - small angle, phase and cross-section det. for small spheres, several materials 7298
  - thermal, by crystal, calc. 7535
  - fast, from Li–D reactions, 37 elements 8204
  - fast neutron energies det. by resonant scatterers 8233
  - neutron-deuteron, amplitudes 8236
  - resonant, slow, from Au 8237
  - Cd slow neutron resonant scatt. 8983
  - resonant, in Sm and Gd 8984
  - 3·27 MeV (d, d), on deuterons 9000
  - slow neutrons by isotropic harmonic oscillator 9002
  - v. slow, inelastic, by Al 9003
  - cold, inelastic, by cryst. matls. 9731
  - by crystals, review 9734
  - Au, Ag, Br, Fe, Co, Ni, Zn, slow neutron spectrom. studies 9735
  - **proton-neutron** see also *Nuclear forces, scattering*
  - differential equation for phase 86
  - 3·1 MeV, ang. dist. 2068, 9001
  - qualitative explanation 3331
  - nuclear forces range, neutron-proton potl. shape effect 4602
  - high-energy, review 4699
  - 27-MeV, ang. dist. 4742
  - high-energy, relativistic corrections 4743
  - 90-MeV, large proton angles 4762
  - review of experiments and theory 4687
  - *n–p* interaction 6034
  - 3 MeV, ang. distrib., cloud chamber study 6484
  - *n* from Be(α), isotropic 8185
  - 2-nucleon systems, scatt. phase shifts 8234
  - 18 to 21-MeV range, cross-sections 8235
  - field corrections, new mixed meson theory 8524
  - e.m. radiation cross-section calc. 8527
  - with repulsive forces 9004
  - by bound protons and crystals 9727

Nickel

- films, magneto-resistance 525
- magneto-acoustic effects 911
- films, adsorbed gases, surface potential 1034
- heat changes accompanying magnetization 1191
- film, as orientated overgrowth 1350

Nickel—*contd.*
  liquid He film transfer 1804
  reversible susceptibility, invest. 1938
  barium mixtures, sec. electrons 2754
  energetic anisotropy 2829
  friction, 4°–600°K strength, hardness 3107, 6519
  ferromag., superficial photoelectric effect 3629
  crystals, mag. domain patterns 4536
  film, oxidation meas. 4779
  magneto-elastic relaxation 4794
  and alloys, mag./props. and thermal 5555
  bicrystals, ferromag. domains 5560
  Hall effect invest. 5622
  alloys, magnetostriction 5623
  magnetostriction, "morphic" effects 5624
  thin foils study 5816
  oxidation kinetics 5856, 7339
  catalyst, activation by heat treatment 5858
  secondary emission 7018
  paramagnetism, theory 7069
  films, ferromag. resonance absorption 7080
  Poisson's ratio from elect meas. 7319
  single crystal, magnetization effect on ultrasonic attenuation 7636
  N_2–CO_2 mixtures, heat conductivity 7804
  liquid, const.-level control 7819
  evap. film, elec. cond. 7887
  abs. energy loss of 18 MeV protons 7956
  domain patterns 8043
  single cryst., new Bitter patterns 8044
  initial susceptibility under tension 8080
  domain wall relaxation 8081
  single crystals, etched surfaces 8341
  low temp. heat conductivity 8678
  magnetoresistance, low temp. 8866
  anodic polishing 9061
  solution potentials 9113
  magnetization, reversible effects 9595
Nickel ammonium sulphate
  paramag. res. absorption 7096
Nickel ferrite
  ferromagnetic resonance 1929
  microwave resonance absorption 8026
  formation, reaction kinetics 8032
Nickel hydroxide
  sols, electron microscopy 5876
Nickel nitrate
  specific heat 65° to 300°K 272
  infl. of mag. field on crystallization 9808
Nickel oxide
  antiferromagnetism 6332
  elec. conduction props. 7880
  NO magnetic rotatory power 8074
Nickel sulphate
  α–$NiSO_4 . 6H_2O$ magnetic anisotropy 2835
  infl. of mag. field on crystallization 9808
Night sky see also *Aurora*; *Twilight*
  counterglow isophotes 27
  false zodiacal light 28
  molec. rotation and upper atmos. temp. 532
  O, forbidden transitions 1137
  OH from H_2O photochem. dissoc. 1534
  observation techniques and results, review 1546
  airglow studies 2220
  altitude of Na *D*-line layer 2224
  i.r. spectrum O_2 bands 2225
  atmospheric Na variation by rocket ejection 2226
  luminous night clouds and auroral arc 2233
  i.r. radiation dist. and u.v. anomalous transparency 3991
  i.r. emission and OH spectrum 3992
  emission spectrum, 6 800 Å to 9 000 Å 3993
  excitation mech. and lat. effect 4950
  N bands excitation functions, invest. 4954
  zodiacal light and earth's outer atmosphere 5020
  illumination mechanism 6644
  H and He excitation, upper atmos. 6645
  upper atmos. physics, lab. study 6646
  spectral analysis in upper atmos. study 6647
  interplanetary matter, zodiacal light 6681
  spectrum, review 7420
  interplanetary matter 7459
  upper atmos. comp., review 7460
Night sky—*contd.*
  photometer for Na *D*-line study 8384
  luminescence, water vap., C oxides and N influence 9852
  infra-red spectrum, analysis 9853
  OH new vibration-rotation band 8385
Niobium
  superconductivity 1849, 2702
  high-temp. struct. and thermal expansion 4908
Niobium nitride
  superconductivity 1065
Nitric oxide
  formation in glow discharges 4589
  NO, NO_2 and H_2O reaction kinetics 4829
  gas-phase reaction with NO 7340
  dimerization 8639
Nitrobenzene
  in CCl_4, optical anisotropy 9402
Nitrogen
  heat conductivity, new meas. 251
  liquid, vapour pressure 257
  zero-pressure thermodynamic properties 275–6
  dissociation energy and afterglow 527
  CO_2/N_2, N_2/H_2, N_2/CH_4 thermal diffusion coeff., pressure dependence 896
  derivatives, molecular orbital theory 1216
  neutron scattering 1323
  absorption by Ba film 1346
  active, energy transfers with Na, K, Sb 1435
  diffusion coeff. in α-Fe 2082
  thermal transpiration 2435
  self-diffusion temp. dependence 2455
  compressibility and corresponding states, theory 2456
  heat of dissoc. 2645
  dielectric properties, microwave meas. 2664
  small-angle X-ray scattering, critical region 2723
  adsorption on catalyst 3158
  heat of adsorption on Cu 3166
  shock front thickness and heat capac. lags 4184
  corona discharges study 4405
  compressed, spark lags 5445
  magnetic rotatory power 5618
  ultrasonics vel. dispersion and anomalous absorption 6805
  liquid, level controller 6932
  heat conduct. and viscosity data 7607
  precipitation in Fe 8246
  self-diffusion coeff. 8568
  compressibility, 10 000 atmos. 9328–9
  influence on night sky luminescence 9852
Nitrogen dioxide
  NO, NO_2 and H_2O reaction kinetics 4829
Nitrogen tetroxide
  molecular structure 1962
Nitrosyl fluoride
  two-dipole moments 8885
Nitrous acid
  rotational isomerism 8638
Nitrous oxide
  heat of dissociation 6522
  det. in air by i.r. spectra 9386
Noise
 acoustic
  noise-cancelling microphone 157, 6087
  continuous spectrum source 304
  excitation pattern effect on pitch 2258
  "white" noise, defn. 2487
  in language engineering 2479
  automobile horns 4216
  random, in attenuating fluid medium 5185
  aircraft, acoustical comfort index 6818
  traffic, levels and spectra 6819
 electrical see *Cosmic radiations*; *Fluctuations, electrical*; *Sun, radiation*
Noise abatement see also *Absorption, acoustic waves*
  theory of sound-proofing 1705
  ditto, experiments 1706
  in offices 4215
  automobile horns 4216
  insulation of concert hall 7647
Nomograms see also *Graphs*
  optical pyrometers 1022
  index of alignment charts 2295

Nomograms—*contd.*
log *ft* calc. for β-transitions 4664
for transformations between chromaticity charts 5339
solution of Kepler's equation 5975
for relative centrifugal force calc. 6761
optimum aperture of optical systems 6825
for Co^{60} shielding calc. 8397
spherical triangle solutions 8425
for gas disch. const. probe invest. 8754
for light scattering by atmos. 9216
relativistic particle collisions 9281
Novae see also *Astronomical spectra*
supernovae dust grains acceleration 795
propagation of shock waves 3300
eruption, qualitative representation 4054
theory, He^3 in stars appl. 5996
Ne in ejected gases 6296
Nuclear decay schemes see *Radioactivity, decay schemes*
Nuclear decay theory see *Radioactive disintegration theory*
Nuclear excitation see also *Nucleus, energy levels*
Coulomb barrier height 542
of N^{14}, by different reactions 614
compound nucleus excitation 2999
(p, n) excit. fns., Cu, Zn, Ag, Cd, Sn 3763
Li^7 and Be^7 spin-orbit coupling 4615
Cl^{36*} γ-level, natural width 4679
B^{11}, α-particle simple capture in Li 4696
Li^7(p, n)Be^7, first excited state 4703
by Coulomb field of pos. particle 4709
mirror nuclei Li^7 and Be^7 4710
Be^8 4739
activation cross-sections, photo-neutrons 4740
energy difference in Li^7–Be^7 4747
drop model expts. 5653
C^{14}(α, p)N^{17} excitation function 5741
N^{13} excited states invest. 5748
Ag$^{107, 109}$, by X-rays 5779
highly-excited N^{15}, energy levels 6386
Os^{186} 6403
Ta^{181}(d, p)Ta^{182}, excitation function 6457*
B^{10}(d, α)Be^8 excitation functions 6458
He^5 excited state, evidence 6460
Ac levels, from Pa α-disintegration 7222
Cu^{65} spins 7243
by μ-mesons, calc. 7255
functions for proton reactions with Na and Mg 7260
Li^{7*} ang. momentum 7261
Be^9, Li^6 low excited states 7262
O^{16}, electron pairs 7263
even nuclei excited states 8115
Xe$^{133, 135}$, following β decay 8174
Si^{29} excited states from (d, α) and (d, p) reactions 8193
by elec. interaction with charged particles 8218
by e.m. field of μ-mesons 8824
Mo^{96} 0·8-MeV excited level, lower lifetime limit 8916
by fast electrons 8956
low-energy X-ray absorpt. 8978
Li^7, γ-radiation isotropy appl. 9677
Nuclear fission
asymmetric, heavy fragment emission 597
excitation functions for charged particles 602
medium-weight elements by protons 604
Bi photo-fission 616
U fission cross-section meas. 622
U asymmetric fission 624
indust. application, economic aspects 2057, 5792
asymmetric, static liquid drop model 2058
n absorption cross-sections, 55 elements 2073
asymmetric and symmetric, probability 2921
yield in photodisint. of U 3026
Cm^{242}, spontaneous 4646
recent experimental work 4689
rel. photo-fission cross-sections 4719
U^{238} resonance photo-fission 4720
thermal neutrons, U data 3785, 4745, 8214
Am$^{241, 242}$ cross-section 4746, 6469
at low threshold, all Z 5734
nucl. compressibility and fission asymmetry 7283
Th^{232} fast n, Be^8 emission 9711
Nuclear fission—*contd.*
products
Pu^{239} fragments, energy dist. 1312
total charges 1313
long-range charged particles in slow-neutron fission 1314
from U^{235}, ionization defects 2059
Xe and Kr isotopes in pitchblende from U^{238} fission 3027
U fragments, ranges in emulsion 3784
emission delay times 3786
Cm^{242}, fragment energies ratio 4646
U, slow-neutron, short-range particles emission 5789
meson prod. accompanying U fission 5790
short-lived Kr, Rb isotopes 7206
Kr^{89}/Kr^{88} ratio 7237
I^{132} production 7282
U^{235} in high-purity U^{238}, photoneutron fission anal. 7284
fragments ionization yields 7285
charges, gaseous and solid media 8210
industrial utilization 8216
short lived activities 8917
U^{238}, Th^{232}, fast neutron, ternary, long-range particles emission 8985
Th^{232}, rel. yields det. 9712
from 2·5- and 14-MeV neutrons on U^{235}, energy dist. 9713
Nuclear fission reactors
neutron flux modulation in reflector 623
electronic pile simulator 630
suitable ceramics, survey 2056
pile control, French work review 3595
North Carolina State College project 3783
Gleep, design and use 4744
low-power, nuclear data 3785, 4745, 8214
U reactor, operation 5791
Bepo, description 6470, 8215
atomic physics textbook 8111
heavy water pile reflector, neutron temp. meas. 8211
cylind. pile crit. state calc. 8212
Chalk River N.R.X. 8213
enriched, homogeneous 8217
theory, neutron diffusion 9005
Norwegian, heavy-water moderated 9714
Nuclear forces see also *Field theory*
exchange currents in nuclei 85
μ-pair theories and π-meson 87
meson theory, intermediate coupling 88
statistical models 540
heavy fragment emission 597
nature of π-meson 632
a 4th-order meson-equation 851
p–p, from scattering expts. 856, 5100
H^4 binding energy 1230
rel. to proton distrib. variation 1236
proton electrostatic repulsion 1239
spin-orbit forces 1241, 1249
neutron binding energies 1277
deuteron photo-disintegration cross-secton 1307
triton binding energy 1618, 3032, 3697, 4593–5
gravitational fluid theory 1626
finite range interactions effect 1966
shell structure effect on masses 1970
Be and D neutron binding energies 2045
asymmetric fission energy barrier 2058
proton and neutron mag. moment 2379
pseudoscalar symmetrical meson theory 2381
velocity-dependent interactions 2917
2-body, consistent with Li^6, B^{10} and Li^7 ground-state conditions 2918
central force matrix element 2919
T h.f.s. and triton anomalous moment 2926
many-Fermion problems, Bloch's sound-wave method 3324
saturation phenomena from pair theories 3326
nucleon-nucleon collision π-meson production 3338
ditto, high-energy, diff. cross-section 8514
n–n and p–p, equality 3696
in nuclear radii det. from α-radioactivity 3700
triplet n–p range 3775
internal excitation and apparent range 4093
H^2, H^3, He^3, He^4 binding energies 4593–5

Nuclear forces—*contd.*
nucleus theory, review 4596
effective range 4602
boundary cond. for descr. of nuclear reactions 4688
H^3 and He^3 photodisintegration theory 4726
primary cosmic-ray meson prod. 4755
Yukawa theory, quantum field theory aspect 5068
n–p interaction, 3 forms 5099
meson fields theory 5113
binding, effect on meson prod. 5118
in nucleon pseudovector coupling theory 5119
3-, 4-particle binding energies 5124
ground state spin, *jj* coupling 5665
internal pair creation 5718
Bethe's neutral theory 6036
reaction cross-sections, ang. dependence 6737
tensor forces and saturation requirements 6745
meson interaction with nuclei 6746
variational approach to nuclear reactions 6751
and e.m. properties of nuclei 7179
angular correl. of radiations, review 7251
singular potentials and effective range theory 7533
mesonic processes in 2-nucleon system 7545
Wheeler compounds 8113
μ-mesons e.m. interactions 8226
binding energies anal., structure hypothesis 8889
binding energies, light nuclei 8892
meson photoproduction in deuterium 8977
neutral scalar mesons with point-contact repulsion 9279
nonlinearity in meson-nucleon coupling 9280
Coulomb function tables 9687
π^- absorpt. in D_2, and *n–n* force 9724
scattering
neutron-proton, differential phase equation 86
ditto, high-energy, relativistic corrections 4743
ditto, with repulsive forces 9004
high energy electrons by protons 373
nuclear charge distrib. 375
proton-proton, 3·4–12·4 MeV 382, 4452
ditto, 120–345 MeV 4450
ditto, spin-orbit interaction 852
fast μ-mesons by nucleons 639
Coulomb, μ-mesons by light nuclei 640
neutron scatt. by C, O 1324
280 MeV neutron cross-sections 1329
270 MeV neutron cross-sections 1330
π-meson scattering by nucleons 1617, 5795
10 MeV *d–p* scattering 2759
anomalous α-particle scattering, spinless nuclei 2965
gamma-rays by nucleons 2988
transparent model 3033
nucleon-nucleon charge-independent interaction 3331
neutron-deuteron scattering 3798
ditto, v. low energies 4101
ditto, high-energy 4765
internal excitation and apparent range 4093
review of *n–p* and *p–p* scatt., 4687
high-energy, nucleon-nucleon, review 4699
coherent scattering amplitudes det. 4737
anomalous μ-meson scattering 4756
higher Born approximations 5125
electrons, effect of finite size of nucleus 5659
nuclear shell structure 5780
test of Bloch model 5806
potential between charged nucleons det. 6038
cross-sections, angular dependence 6737
asymptotic phases calc. and variational principle appl. 6743
particle scattering by static potential 6747
resonance levels and scattering length 7252
non-linear effects 7542–3
neutron polarizability meas. 8129
mesons, double scattering by nucleons 8990
Yukawa non-relativistic 2nd approx. 9277
plane wave by square well potl. 9278
Nuclear induction see *Nuclear magnetic resonance*
Nuclear isomers see *Nucleus, energy levels*
Nuclear magnetic resonance
nuclear gyromagnetic ratios det. 546
in solids, effect of quadrupole moments 548
NO_2 1182
relaxation time in metals 1229

Nuclear magnetic resonance—*contd.*
review article 1233, 1972–3
new integration method 1237
K^{39} 1246
proton relaxation and catalyst accessibility det. 1404
high polymer study, line widths 1459–60
F^{19} chemical shifts 1976
Ga and In nuclear moment discrepancies 1977
$Nd^{143, 145}$ spin det. 1981
determination of proton magnetic moment 1982
metallic Li 2524, 4256
crystals spectra, hyperfine structure 2821
in methane 2899
use of omegatron 2913
observation with single sweep 2915
liquids, spin echoes 2922
proton diamag. corrections, water and oil 3702
Li^6 and Li^7, quadrupole splitting 3703
H in Ta, internal motion 4570
Be^9 spin det. 4601
proton mag. shielding, H_2, H_2O and oil 4605
nuclear induction recording 4612
time-average mag. field at nucleus 4613
$NaSbF_6$ 5549
flowing liquids 5557
paramagnetic displacement 5574
high balance-stability detector circuit 5598
mag. shielding, effect on frequency 5663
fine structure in liquids 6066
transverse relaxation meas. 6384
Cu in cryst. field 6385
$Rb^{85, 87}$, I^{127} mag. moments det. 6390
study of transitions in polymers 6550
historical survey 6851
nuclei paramag., magnetic-spin reson. study 7085
proton line decomp. in paramag. crystals 7094
optical methods of study 7139
magnetic shielding in molecules 7149
proton, in solid hydrocarbons 7164
ditto, liquid 8109
ditto, in polyethylene 1226
nucl. moments invest., review 7181
D^2 and H^1 invest. 7182
super-regenerative techniques 7183
form of signals, theory 7184
in crystals 7382
determination methods 8122
study of a transient phenomenon 8123
double-T bridge, study 8124
long-duration magnetizations, relaxation 8125
influence of spin system phase memory 8126
atomic Cl^{35} and Cl^{37}, ${}^2P_{3/2}$ state h.f.s. exam. 8128
Be^9, Al^{27} and Si^{29} in beryl, meas. 8130
S^{33} 8132
Pr^{141} 8133
weak freq. shifts meas. 9604
$Li_2SO_4 . H_2O$ structure invest. 9634
study of weak lines 9638
temperature effects, Na^{23} 9639
relaxation in gases by surface catalysis 9640
absolute amplitude meas. 9642
Nuclear photo-effect see *Nuclear reactions, photons*
Nuclear reactions see also *Nuclear excitation*; *Nuclear fission*; *Radioactivity*; *Thermonuclear reactions*
magnetic analyser for charged particles 1115
with C^{12} and C^{13} stripped nuclei 1870
Coulomb functions tables 2391
$\alpha\gamma$ ang. correl., in cascade 2962–3
compound-nucleus theory verification 2991
compound nucleus excitation 2999
spallation reactions invest. 3015
nucleon-nucleon, charge-independent 3331
high-energy, statistical computation 3336
reduced widths det. from 1-level dispersion formula 3698
nuclear physics, review 3760
π-meson absorption and emission 3788
boundary conditions for description 4688
v. fast particles, recent work 4689
due to Coulomb field of pos. particle 4709
M.I.T. cyclotron arrangements 5474
ang. momentum conservation 5729
nuclear evaporation and star production, review 5730

A complete list of the Subject Headings will be found at the end of the Index.

Nuclear reactions—*contd.*
- in shaped charges explosion 5735
- meson prod. in collisions 5800
- data tables for $Z \leqslant 20$ 6402
- angular-correl., atomic shell influence 6444–5
- nucleon cascade theory 6446
- cascade fluctuation 6447
- variational approach 6751
- angular correlations review 7251
- nucleon cascade with ionization loss 7253
- singular potentials and effective range theory 7533
- polarized, ang. dist. formulae 8180
- high-energy nucleons with heavy nuclei 8181
- effect of Hartree potl. on Q-value 8184
- $He^3 + He^3$ 8957
- use of separated isotopes 9646
- stars due to C ions from cyclotron 9683
- apparatus for searching particle-sensitive plates 9901
- **chemical effects** see also *Chemical effects of radiations*
  - atoms from U^{238} in (n, γ) separation 626
  - Szilard–Chalmers yields, fast and slow neutrons 3756, 9070, 9779
  - Sb activity enrichment Szilard–Chalmers effect 3757
  - ditto, radiochlorine separation 3758
  - (n, γ) effects in iodobenzene 4731
  - effect of atomic pile radiation on water and B solns. 5872
  - Szilard–Chalmers process, review 9778

Nuclear reactions due to
- **alpha rays**
  - new Ir isotopes from Re 566
  - Tb and Ho isotopes by bomb. of Eu, Tb 568
  - fission excitation functions 602
  - $Be(\alpha, n)$ neutron spectrum 603, 8185
  - ditto, gamma-rays 2993, 6450
  - Ag, Cd activities by α on Rh, Pd 1995
  - neutron-def. Ta and W isotopes 2002
  - Rb isotopes by α on Br 2942
  - $F(\alpha, p)Ne$ resonance, ang. distrib. 2992
  - 20 MeV, Li_2O and C bombardment 2994
  - p and n from Ne^{22} 3761
  - (α, n), ang. dist. 4694
  - (Al, B) (α, p), Q-values 4695, 7256, 8958
  - simple capture in Li 4696
  - compd. nucleus F^{18} proton emission 4697
  - thick target fast neutron yield 4698
  - $Li^7(\alpha, \alpha')Li^{7*}$ 5740
  - $C^{14}(\alpha, p)N^{17}$, excitation function 5741
  - π^- meson spectrum, carbon 5742
  - $PbCl_2$ and PbI_2 bombardment, recoil ranges 6451
  - $C^{13}(\alpha, n)O^{16}$ analysis 9686
  - light nuclei, Coulomb functions 9687
- **cosmic rays** see also *Cosmic rays, effects*
  - nuclear disintegration cascades 464
  - studies at various altitudes 478
  - heavy fragment emission 597
  - v. high-energy events 599
  - by particles of great energy 598
  - comparisons with known homogeneous primaries 600
  - nature of emitted particles 601
  - nuclear interaction length of shower particles 2796
  - atmospheric transmutation of elements 2800
  - energetic heavy particles emission 2812
  - Li^8 ejection 2803, 2813
  - Pb nuclei disintegration 2814
  - in photo plates under C absorbers 2815
  - high altitude, particle distrib. 3621
  - neutron prod. at sea-level 4512
  - in Pb and Al 4514–15
  - in Au, properties of particles 5520
  - Au interactions of shower particles 5521
  - altitude and latitude variation 5536
  - review 7058
  - nucleon diffusion in atmos. and interaction props. 7254
  - production of radioactive nuclei in stars 8829
  - high-energy event at 4 550 m 9582
  - light nuclei, fragments of charge $> 2\ e$ 9583
- **deuterons**
  - new Ir isotopes from Os 566
  - Ho isotopes by bomb of Dy 568
  - fission excitation functions 602
  - Li^8 splinter production 607

Nuclear reactions due to
- **deuterons**—*contd.*
  - $Al^{27}\ (d, \alpha/p)\ Mg^{25}/Al^{28}$, ang. distrib. 610, 2039, 7264
  - $O^{16}(d, p)O^{17}$ ang. distrib. 610, 3017
  - d–d neutrons angular dist. 611, 3767, 8189, 8972
  - neutrons from separated Mg isotopes 612
  - (d, p) reactions, p, γ-coincidences 613
  - $D(d, n)\ He^3$, energy 619
  - C^{12}, long range protons 1303
  - C^{12}, proton spectrum 4716
  - C^{12}, proton ang. distrib. 8191
  - $D(d, n)$ neutron generator 1320–1
  - T + D reaction, theory 1622
  - Ag, Cd activities by d on Pd, Ag 1995
  - $Li^6(d, p)Li^7$ proton groups ang. yield 2036, 7261
  - enriched Si, proton groups/atomic masses rel. 2040
  - C^{14} bombardment 2041
  - $T(d, n)\ He^4$, 90° cross-section 2042
  - ditto, proton ang. distrib. 2043, 5758
  - 10 MeV, Li_2O and C bombardment 2994
  - $Mn^{55}(d, p)Mn^{56}$ and $V^{51}(d, p)V^{52}$, Mn^{56} and V^{52} energy levels det. 3007
  - $C^{13}(d, p)C^{14*}$, excited state meas. 3009
  - $N^{14,\,15}(d, p)N^{15,\,16}$ proton groups 3010
  - C^{13}, high-energy neutrons 3011
  - $A^{36}(d, p)A^{37}$ 3012
  - proton groups from B^{10} 3013
  - on F^{19} and P^{31}, proton groups 3014
  - Cu spallation, excitation functions 3015
  - angular distrib. in (d, n) and (d, p) reactions 3016, 3766, 4694, 4712, 8194, 8971, 8973, 9697
  - C^{13}, 1-MeV energy level invest. 3699
  - $B^{11}(d, \alpha)Be^{9*}$ 3712
  - $Be^9(d, \alpha)Li^7$, Q-values, new Li^7 state 3764, 5740, 9700
  - $Na^{23}(d, \alpha)Ne^{21}$ α-groups 3765
  - high-energy neutron yields 4698, 4705
  - reaction energies from magnetic anal. 4706
  - nuclear excitation and disintegn. 4709
  - (d, p), neutron binding energies 4711
  - $N^{14,\,15}(d, \alpha)C^{12,\,13}$, Q-values 4714
  - D–D reactions, probabilities and cross-sections 4715
  - $Be^9(d, n)B^{10*}$, thresholds, spectrum 4717, 8959
  - $B^{10}(d, p)B^{11*}$ levels det. 4718
  - $Li^7(d, t/p)$, $Li^6(p, p')$ 5740
  - $Li^{6,\,7}\ (d, n\gamma)Be^{7,\,8}$ angular correl. 5754, 8192
  - on Be, fast neutrons ang. dist. 5755
  - $Li^6(d, \alpha)\alpha$, total yield, ang. distrib. 5756, 7261
  - protons, tritons and alphas from Be, ang. yield 5757
  - C^{13}, cross-sections and Q-values 6455
  - $Li^7(d, \alpha n)He^4$ α–α coincid. 6456
  - $Ta^{181}(d, p)Ta^{182}$ 6457*
  - $B^{10}(d, \alpha)Be^8$ excitation functions 6458
  - 800-kV neutron generator, Istanbul 6480
  - $Be^9(d, n)B^{10}$ γ-ray search 7265
  - d–d, as polarized neutrons and protons source 8180
  - D–He^4 interactions, 10·3 MeV 8190
  - Si^{29} excited states from (d, α) and (d, p) reactions 8193
  - 20 MeV, neutron ang. distrib. 8195
  - γ-rays from $B^{10,\,11}$, N^{14}, F^{19} 8196
  - $O^{16}(d, n)F^{17}$ neutron groups, thresholds 8959, 8970
  - fast nucleons exchange collisions 8968
  - neutron thresholds, light elements 8969
  - 10-MeV (d, n) reaction thick target yields 9008
  - d on Be, emulsions comparison 9538
  - light nuclei, Coulomb functions 9687
  - C, O, Mg, α-particle analysis 9695
  - $O^{16}(d, n)F^{17}$, ang. distrib. 9696
  - Ne bombardment study 9698
  - Li^6, p–γ ang. correl. 9699
  - $H^3(d, p)H^4$, possibility 9701
- **electrons**
  - polarized, high-energy X-ray production 4418
- **gamma rays** see *Nuclear reactions due to photons*
- **mesons** see also *Cosmic rays, effects*
  - nuclear meson absorption 1299
  - π^--capture in H, γ-ray spectrum 1300
  - capture of slow negative μ-mesons 2816
  - π^--mesons 3048
  - neutrons from stoppage of mesons in Pb 5737
  - π^-, in nuclear emulsions 5738
  - abs. by D, γ-ray spectra 5739

Nuclear reactions due to
mesons—*contd.*
μ^-, endings 5742
π, with C and Al nuclei 6449
nuclear excitation by μ-mesons 7255
π^- mesons in T 8225
μ-mesons, underground 9684
μ-meson-induced disintegrations 9685
neutrons see also *Nuclear fission*
Cu^{64}, Br^{80}, Br^{82}, I^{128} branching 582
$B^{10}(n, \alpha)Li^{7}$, fast 619, 8986
ditto, slow 2054, 3776, 7279
ditto, Li^{7}/Li^{7*} ratio 4733
ditto, review 5660
ditto, radiography appl. 8419
Fe (n, α) slow neutrons 620
$S^{32}(n, p)P^{32}$, $P^{31}(n, p)Si^{31}$, energy dependence 621
$C^{14}(n, \gamma)C^{15}$ 625, 8202
Pb cross-section, energy dependence 627
S nuclear energy levels investign. 628
fast deuteron production 629, 1311
rel. π^+- and π^--meson yields 633
cross-sections at 120 and 345 eV 651
elements, absorption cross-section 652
nuclear binding energies 1277
(α, n), $(\alpha, 2n)$ $(\alpha, 3n)$, rel. to alpha-decay theory 1279
fast neutrons, capture cross-sections 1310, 6464
γ-rays from Cd, Cl and C 1315
280 MeV neutron cross-sections 1329
270-MeV neutron cross-sections 1330
Cd^{105} by n on Cd 1995
Ta isotopes from n on Ta 2002
n-capture gamma-ray spectra 2022
90 MeV, proton and deuteron ejection 2050
He^{3} disintegration 2051
Mo and Br cross-sections, slow neutrons 2052
slow, resonance capture by U^{238} 2053
deuteron disinteg. calc. 2055
Ba^{131}, γ-radiation 2987
$N^{14}(n, p)C^{14}$ and $N^{14}(n, \alpha)B^{11}$ at 150–2100 keV 1309, 3028
cross-sections for 33 elements at 42 MeV 3029
H, C total cross-sections 3030, 3038, 5786
high-energy scattering 3033
Be, B, O and F cross-sections, fast neutrons 3034
150 MeV, star production 3036
14-MeV, on tritons, ang. dist. 3037
$Pu^{241}(n, \gamma)Pu^{242}$ 3721
slow, capture α-rays, Be, C, N 3752
slow, (n, α) in Fe 3779
14 MeV, cross-sections 3780
$(n, 2n)$ and (n, p) cross-sections 3781
resonance scattering review 3782
U, thermal cross-section 3785
isotopic separation by (n, γ) recoil 4625
scattering, Z-dependence 4727
interaction cross-sections, sphere method 4728
fast neutrons interactions with Bi, Pb, Tl and Hg 4729
slow, cross-sections, 12 elements 4730
nuclear isomer formation, capture levels invest. 4732
$Li^{6}(n, \alpha)H^{3}$, energy spectrum, range 4734, 4738, 5781
Am^{241} capture cross-section 4735
coherent scattering amplitudes det. 4737
C^{12} and B^{10}, fast neutrons 4739
Li dosage and localization in minerals 4884
W^{188} by W^{186} successive n-capture 5699
Pb, Bi γ-rays 5728
cross-section variation at high energy 5783
cross-sections, high-energy absorption, interpretation 5784
Be, Al, S, Pb total cross-sections 2–6 MeV 5785
polarized (n, γ) effects 5787
fast, He total cross-section 5788
$C^{12}(n, 2n)C^{11}$, in anthracene 5809
Ne disintegration by fast neutrons 6465
Br, cross-section 6466
Co^{59} capture cross-section 6468
high energy threshold detectors 6482
Hg, thermal neutrons 6483
$N^{14}(n, p)$ proton range 7027
Zr and Hf cross-sections 7280
inelastic scatt., Be, Cu, Cr, Fe 7281
use for chemical analysis 7367

Nuclear reactions due to
neutrons—*contd.*
ore sorting by neutron-induced activity 8153
cross-sections 10 elements, 156-MeV neutrons 8207
resonant scattering from Au 8237
(n, n) and (n, p) resonances in P^{31} and S^{32} 8980
Mg and Si, total cross-sections below 800 keV 8981
n D capture mechanism 8982
$B^{10}(n, \alpha)$ cross-section, rel. to neutron energy 8986
failure to find 6-day Sb^{120} 9665
on Au, Ag, Br, Fe, Co, Ni, Zn, slow vel. spectrometer studies 9735
photons
Bi photo-fission 616
photo-neutron yields, 320-MeV Bremsstrahlung 617, 7267
deuteron photo-disintegration 618
ditto, experiment 1307, 2046, 3022, 4723, 5775
ditto, triplet n–p range 3775
ditto, proton ang. distrib. 5763, 9704
ditto, mag./elec. cross-section 3773
nuclear dipole vibration resonance 1235
$S^{32}(\gamma, d)P^{30}$, mass anomaly S^{32} 1256
Mo^{100}, relative (γ, n), (γ, p) cross-sections 1278
$O^{16} \rightarrow 4\alpha$ 1305, 3024–5
Be^{8} ground state in photo-disintegration stars 1306
$Li^{7}(\gamma, p)He^{6}$ 1308
$A^{40}(\gamma, p)Cl^{39}$ 1996, 8975
stars in emulsions 2029, 5768
$O^{16}(\gamma, \alpha)C^{12}$ 2044
Be and D thresholds, cross-sections 2045, 2048
Ag and Al, (γ, p) and (γ, n) rel. cross-sections 2047
Hg^{198}, resonant scattering 2990
$C^{12}(\gamma, p)B^{11}$ excitation function 3018
$Be^{9}(\gamma, n)Be^{8}$, neutron yield 3019
neutron yields 33 elements 3020
gamma-neutron cross-sections 3021
Co^{58m} from (γ, n) 3023
$C^{12} \rightarrow 3\alpha$, thresholds 3024
ditto, resonance curve 3768
ditto, fall and rise of cross-section 3774
$O^{16} \rightarrow 2Be^{8}$ 3025
U, fission and neutron yields 3026
$N^{14}(\gamma, d3\alpha)$, $N^{14}(\gamma, p\ n\ 3\alpha)$ 3770
photo-neutron thresholds, resonances 3771, 7266
mesons from C, calc. 3772
ditto, experiment 5767
rel. photo-fission cross-sections 4719
U^{238} resonance photo-fission cross-section 4720
Cu foil, 24-MeV bremsstrahlung 4721, 6304
C, high-energy protons 4722
$S^{32}(\gamma, d)P^{30}$, $S^{32}(\gamma, np)P^{30}$, $P^{31}(\gamma, n)P^{30}$ 4724, 7272
photo-nuclear reactions, model 4725
H^{3} and He^{3} photodisintegration theory 4726, 9635
neutral meson production 4754
ditto, from H, experiment 8979
π-meson production, calc. 4757, 8198, 8201
ditto, experiment 6463
new radioactive isotopes 5693
photomeson production, calc. 5739
$Li^{6}(\gamma, n)Li^{5}$ 5760
Rb^{87}, γ–α reaction 5761
emulsion stars from hard X-rays 5762
activation of Bi 5764
C, Zn cross-sections, 322-MeV bremstrahlung 5765
shower theory, transition curves 5766
$C^{12}(\gamma, n)C^{11}$, cross-section 5769
Fe^{54}, Ni^{58}, Zn^{64} photoneutron cross-sections 5770
photo-neutron yields, interpretation 5771
280 MeV total cross-sections, Be, Al, Cu, Sn, Pb, U 5772
C, 100 MeV X-rays 5773
$O^{18}(\gamma, p)N^{17}$ 5774
direct photodisint. processes 5776
Mg photoprotons 5777
photoproton yields, 20 elements 5778
ang. distrib. of photons in showers in Pb 6304
K^{40}, positron search 6410
Be, high-energy γ-rays 6461
U^{238} photoneutron threshold 6462
μ-meson production, calc. 6472
photo-proton yields, ang. distrib. 7268
Na^{20} from NaF 7269

Nuclear reactions due to
photons—*contd.*
X-rays on Cu, energy and ang. dist. of particles 7270
He^{4} photodisintegration by 100 MeV X-rays 7271
ditto, 300 MeV 9707
(γ, n), (γ, p), $(\gamma, 2n)$ resonances C^{11}, Na^{24}, Cu$^{61-2,\ 64}$, Mo^{91}, Pb^{204}, Tl^{206} 7273
Cu^{63} γ-absorption cross-section 7274
photo proton emission, Al, Pb, 9 other elements 7275
Cu^{63}, Zn^{64}, C^{12} (γ, n) cross-sections 7276
γ–p cross-sections, C, Al, Co, Ni, Cb 7277
In, bremsstrahlung resonances 7278
Be$^{9}(\gamma, n)$ cross-sections 8197
P^{33} production 8914
B$^{11}(\gamma, \alpha)$Li^{7} and B$^{11}(\gamma$, T)Be^{8}, levels analysis 8974
A^{40}, anomalously larger (γ, p) cross-section 8975
proton spectrum from C(γ, p) 8976
failure to find 6-day Sb^{120} 9665
B$^{10}(\gamma, d)$2He^{4} 9702
α-particle photodisintegration theory 9703
ditto, reverse processes 3769
emergent protons, energies and ang. dist. 9706
27-MeV, combined Tl$^{206,\ 207}$ yield 9708
high-energy photoeffect calc. 9709
protons
p–n collisions, Bremsstrahlung 76
Tb and Ho isotopes by bomb. of Gd, Dy 568
fission excitation functions 602
medium-weight elements fission 604
B$^{10}(p, \alpha)$Be^{7}, magnetic analysis 606
Li^{8} splinter production 607
H$^{3}(p, n)$He^{3}, constants 608, 8959
O$^{18}(p, \alpha)$N^{15}, thin target yield 609
ditto, resonances 5750
F$^{19}(p, \alpha)$O$^{16*}(\gamma)$O^{16}, ang. correl. 1301, 3000
ditto, analysis, electron pairs 2037, 7263
Li$^{7}(p, \gamma)$Be^{8}, ang. distrib. 1302, 6454
on P, γ-ray resonances and yield 1304, 5749
single collision, multiple meson production 1316
Ag, activities by p on Pd 1995
Ta, W isotopes from p on Hf, Ta 2002
V$^{51}(p, n)$Cr^{51} neutron spectrum 2033
neutrons from Be, energy dist. 2034
threshold energies for neutron emission 2035
neutron production below (p, n) threshold 2038
Li$^{7}(p, n)$Be^{7} search for levels 2995
stars from 350- to 400-MeV protons 2998
C$^{13}(p, n)$N^{13}, neutron yield 2999
(p, n) on Sc and V 3002
(p, n), 16-MeV, neutron spectra 3003
N$^{15}(p, \alpha)$C^{12}, thin-target yield 3004
γ-rays from, light elements 3005
stars, hammer tracks 3006
in white dwarf stars 3301
(p, n) excit. functions, Cu$^{63,\ 65}$, Zn$^{66-8}$, Ag$^{107,\ 109}$, Cd$^{110-112,\ 114}$, Sn$^{117,\ 120,\ 122}$ 3763
Li$^{7}(p, \alpha)$He^{4}, Q-values 3764
ditto, angular distrib. 4707
Bi$^{204,\ 206}$, from Pb, prep. and isolation 4700
Mn^{52} from Cr 4701
330-MeV, high-energy neutrons ang. dist. 4702
Li$^{7}(p, n)$Be^{7}, first excited state 4703
P$^{31}(p, \alpha)$ α-ray spectrum 4704
high-energy neutron yields 4705, 5743
reaction energies from magnetic anal. 4706
Be bombard., deuterons and alphas ang. yield 4708
Li^{7} and Be^{7} mirror nuclei, excited states study 4710
p–p meson production 4748, 5126
Li$^{7}(p, p')$Li^{7*}, Li$^{6}(p, p')$Li^{6*} 5740
meson prod. by p on D, calc. 5746
Li, Be from heavy nuclei 5747
stars in photo emulsions 5752
Mn$^{55}(p, n)$Fe^{55} n-spectrum 5753
elastic scattering, survey expts. 6267
$p+p \rightarrow \pi^{+}+d^{*}$ 6452
(p, α) in Li^{6}, Li^{7}, N^{15} Q-values 6453
800-kV neutron generator, Istanbul 6480
N^{14} transmutation 7257
on Be and C, 100-MeV, neutron energy dist. 7258
gamma-rays from Li^{7} 7259
on Na and Mg, excitation functions 7260
Be$^{9}(p, \alpha)$Li^{6*} energy levels 7262
Li$^{7}(p, n)$Be^{7} neutron thresholds 8186, 8959

Nuclear reactions due to
protons—*contd.*
Al products and excitations 8187, 8964
Be$^{9}(p, p2n)$Be^{7}, cross-section, 156 MeV 8960
H$^{3}(p, \gamma)$He^{4}, excitation curve 8961
341-MeV $p+p$, π^{+} meson prod. 8962
340-MeV elastic scatt., C, Cu, Pb 8963
C$^{14}(p, n)$N^{14} 8965
Fe^{59} from Co, prep. and isolation 8966
Cr^{51} from V, prep. and isolation 8967
Te$^{122}(p, n)$I^{122} 9655
failure to find 6-day Sb^{120} 9665
lighter nuclei, Coulomb functions 9687
proton capture in light elements 9688
electron pair emission from nuclei, search 9689
240-MeV on C, proton emission at 90° 9690
$p + p \rightarrow d + \pi^{+}$, deuteron pol. and ang. dist. 9691
on Cl, α-, n- and γ-radiation yields 9692
tritons
fast neutrons from T+D and T+Li 615
T+L reactions 5759
Li+T, neutron yield 6459
T–T, He^{5} excited state, evidence 6460
X-rays see *Nuclear reactions due to photons*
Nuclear reactors see *Nuclear fission reactors*
Nuclear transmutation see *Nuclear reactions*
Nucleus see also *Elements, origin*; *Radioactivity*; *Scattering, particles*
charge distribution from electron scattering 375
specific heat, paramagnetic Cu salts 1183–4
He^{4} binding energy 1230
dipole vibrations 1235
density distrib. and shell structure 1239
isomerism and shell structure 1249, 1965
shell-model and C^{14} beta-ray spectrum 1282
stable nuclei characteristics 1967
μ_{p}, F and M_{p}/m_{e}, using omegatron 2913
magic numbers, 3rd-order difference? 2916
2-body interaction consistent with Li^{6}, B^{10} and Li^{7} ground-state conditions 2918
natural α-emitting elements, linear props. 2964
transparent model neutron scattering treatment 3033
r.f. spectroscopy, conf. rep. 3428
nuclear radii from α-radioactivity 3700
nuclear surface energy 3701
H^{2}, H^{3}, He^{3}, He^{4} binding energies 4593–5
nuclear models, review 4596
He isotopic weight 4598
audiofrequency spectroscopy 4606
classification of natural nuclei 4617
proton emission from compd. nucleus F^{18} 4697
shell structure and neutron binding energies 4711
photo-nuclear cross-sections study 4724
neutron diffraction, coherent scattering props. 4737
electrostatic expansion 4747
photon collision, meson production 4757
alignment, paramag. salts 5572
drop model expts. 5653
finite size, effect on electron scattering 5659
spatial alignment det. 5671
nuclear evap. process, fluctuation 5690
Pb^{210} binding energy 5728
shell structure data from neutron scattering 5780
high-energy neutrons cross-sec. interpret. 5784
Bloch model, neutron scattering test 5806
magic numbers and Tc and Pm 6387
β-decay ft values and shell models 6389
atomic physics textbook 8111
radii calc. from neutron cross-sections 8116
invest. by microwave spectroscopy, review 8120
size, influence on retardation radiation 8121
polarizabilities meas. by scattering expts. 8129
mass discontinuities, nuclear shells and subshells 8890
binding energy surfaces near magic numbers 8891
H^{3}, He^{3} (erratum) 9635
electric moment see also *Molecules, nuclear coupling*
quadrupole interactions in crystals 548
quadrupole frequencies in crystl. I compds. 952
stable nuclei, relative values 1967
quadrupole moment, electron-cloud screening 1974
quadrupoles moment rel. to Z value 2910
heavy nuclei, quantization 2925
complete reference tables 2938, 6402

A complete list of the Subject Headings will be found at the end of the Index.

Nucleus—*contd.*
  electric moment—*contd.*
    quadrupole, nuclear shell model 3705
    present knowledge, review 4596
    polarization by elec. fields 4610
    184 species, table 5255
    Cu Tutton salts 5576
    deuteron quadrupole moment 5672
    magnetic shielding in molecules 7149
    nuclear induction invest. review 7181
    quadrupole, atomic beam method 7188
    quadrupole coupling in crystal 7382
    microwave spectroscopy det., review 8120
    exptl. methods, review 8898
    Br 3704
    Cl and Br quadrupole resonances in crystalline organics 7147
    Cl^{35}, Cl^{37} quadrupole, ratio 4609, 5668, 8128
    Cu isotopes, quadrupole 6385
    Cu$^{63, 65}$ magnetic effects 9605
    Ge isotopes quad. moment 5661
    Ir isotopes 1244
    Li$^{6, 7}$, quadrupole 1245, 3703
  energy levels see also *Radioactivity, decay schemes*
    Coulomb barrier height 542
    systematic classification 1238
    isomeric transitions and shell structure 1249, 1965
    trends, as fn. of neutron and proton numbers 1965
    light nuclei, neutron to Ne^{23} 2911
    Z-11 to 20, tables 2912
    d^3 and *d*^{4} configuration coeffs. 2919
    s, *p* and *d* shells, radial integrals 2920
    complete reference tables 2938, 6402
    compound nucleus, evidence from C^{13}(*p*, *n*)N^{13} 2999
    spin and parity assignment from (*d*, *p*), (*d*, *n*) ang. distrib. 3016
    reduced widths det. from 1-level dispersion formula 3698
    some long-lived isotopes 3729
    momentum distrib. from photo-nuclear meson prod. 3772
    by fast *n* scattering, review 3782
    interaction effects on radiative transitions 4095
    metastable, interpretation review 4592
    light nuclei, density of states 4603
    capture levels in isomer formation 4732
    particle in potl. well, level perturbation 5657
    ground state spin in *jj* coupling 5665
    level densities, variation with *Z* 5782
    metastable states, isomeric nuclei 6407
    study by ang. correl., review 7251
    resonance levels, rel. to scatt. length 7252
    spheroidal nuclear well 8117
    statistical distribution 8886
    isomeric transitions interpretation 9658
    review of exptl. methods 9668
    light nuclei wide levels 9710
    Ag$^{107, 109}$, excitation by X-rays 5779
    Al 3003, 4741, 5785, 7264, 9676
    As^{77} 4648
    Au 3003, 3777, 8175
    B$^{10, 11}$ 3013, 3034, 4717–18, 8927
    Ba$^{133, 135}$ 8944, 8947
    Be 605, 1228, 1306, 2031, 2995, 3003, 3028, 3034, 4615, 4710, 4739, 5656, 5785
    Br^{82} 3738
    C$^{12-14}$ 603, 2970, 2994, 3009, 3699, 4600, 8185
    Cd 585, 2941, 8921, 8983
    Ce^{140} 9672
    Cr^{52} 3002
    Er^{166} 2956
    F 3014, 3034, 9693–4
    Fe 3003, 4741, 5753
    Gd 8984
    He^5 ground and lower levels 544, 6391, 6456
    I^{131} 6412
    Ir 1244
    K^{40} 4656
    Kr$^{83, 85}$ 580, 4651
    La^{140} 8926
    Li$^{5-8}$ 4615, 4710, 5656, 5658, 5740, 5760, 6391, 8893, 9700
    Mg$^{24-5}$ 1228, 2039

Nucleus—*contd.*
  energy levels—*contd.*
    Mn^{56} 3007
    N$^{13-15}$ 614, 3752, 4600, 5748, 6386, 8965
    Ne^{21} 3765
    O 3034
    Os^{192} 5708
    P 3014, 4768
    Pb 627, 4741, 5688, 5785
    Pr^{144} 7246
    Pt^{192} 5708
    Ra excited levels 6419
    RaE isomeric state 6388
    Rb^{91} 5700*
    Rh 3003
    S 628, 5785
    Se 576–7, 4648
    Si^{30} 8927
    Sm 8984
    Sr^{87} 2960
    Ta^{1811} 2941
    Ti^{46} 3002
    Tl 3003
    V^{52} 3007
    Xe^{133} 581, 4651
    Y$^{87, 89}$ 2960, 8920
    Zr^{89} 5715
  excitation see *Nuclear excitation*
  magnetic moment see also *Molecules, nuclear coupling, Nuclear magnetic resonance*
    single-particle model 538
    quasi-atomic model hypothesis 547
    accurate det., review 1247
    interaction with extranuclear electrons, N nucleus in N^{14}O^{16} 1724
    stable nuclei, relative values 1967
    odd nuclei, empirical rule 1975
    light nuclei, space exchange 1979
    deviation from Schmidt limits 2914, 8134, 9636
    spin echoes 2922
    some stable isotopes 2924
    angular momenta quantization 2925
    triton anomaly 2926
    complete reference tables 2938, 6402
    present knowledge, review 4596
    diagram for evaluation 4604
    atomic h.f.s. invest. 4611
    184 isotopic species, table 5255
    similarity between neutron and proton states 5667
    spatial alignment from paramag. salt demag. 5671
    magnetic shielding in molecules 7149
    by microwave Zeeman spectra 7155
    interaction mechanism 7180
    nuclear induction invest., review 7181
    super-regenerative techniques 7183
    nuclear gyromagnetic ratios 7185
    microwave spectroscopy det., review 8120
    methods of determination, review 8122, 8898
    calc., using *j–j* coupling scheme 8127
    mag. and elec. quadrupole interactions ratio, Cl^{35} and Cl^{37} 8128
    meson coupling calc. 8895–6
    beats of beats 8897
    even–odd nuclei, deviations 8900
    coupling in paramag. single cryst., v. low temp. 9602
    Ag isotopes 2927, 4597
    Al^{27} 7185
    B^{11} 7185
    Be^9 5666, 7185
    Bi^{209}, spectroscopic value 1978
    Br 3704, 7185
    Cl isotopes 2924
    Cs^{133} 7185
    Cu$^{63, 65}$ 7185
    F^{19} 7185, 9643
    H$^{1-3}$ 2926, 7182
    Ga, In, discrepancies 1977, 2924
    I$^{127, 129}$ 5664, 6390, 7185
    La^{139} 7185
    Lu^{176} on shell model 9637
    Mg^{25} 5666
    Mn^{55} 7185
    Na^{23} 4608, 7185

A complete list of the Subject Headings will be found at the end of the Index.

Nucleus—*contd.*
magnetic moment—*contd.*
Nb^{93} 7185
Nd$^{143, 145}$ 7186
O^{17} 5669
P^{31} 7185
Pr^{141} 8133
Rb$^{85, 87}$ 6390, 7185
Re$^{185, 187}$ 5666
Rh 1980
S^{33} 2923, 8132
Sb$^{121, 123}$ 2924
Sc^{45} 1243
Sm$^{147, 149}$ 7186
Tl$^{203, 205}$ 7185
V^{51} 7185
magnetic resonance absorption see *Nuclear magnetic resonance*; *Paramagnetic resonance absorption*
spin see also *Molecules, nuclear coupling*; *Spin-lattice coupling*
in solids, quadrupole interaction effect 548
spin-orbit coupling 1240
spin-dependent "radii" 1242
finite range interactions effect 1966
stable nuclei, relative values 1967
polarization correl., mixed multipoles 1968
spin echoes 2922
complete reference tables 2938, 6402
ang. distrib. study, $\alpha\gamma$ from $F + p$ 3000
(d, p) and (d, n) ang. distrib., spin and parity assign. 3016, 8973
present knowledge, review 4596
rel. to mag. moment 4604
resonant heating, audiofreq. spectroscopy 4606
spin system at negative temp. 4607
spin-dependent neutron scattering 4737
flip probability, neutron scatt. depolarization 4768
184 isotopic species, table 5255
jj scheme, ground-state 5665
cons. of ang. mom. in reactions 5729
l-shells splitting by tensor interaction 6392
paramag. resonance invest. 7101
magneto-optical study 7139
mag. shielding in molecules 7149
spin-orbit coupling, large rot. quant. no. 7151
atomic beam method 7188
excited states, even nuclei 8115
microwave spectroscopy det., review 8120
phase memory, effect on nucl. reson. signals 8126
reaction products, from n ang. distrib. 8195
classification of isomers 8894
from ang. correl. between proton and γ-ray from excited intermed. state 8899
from β- and γ-spectra, review 9668
Ag^{111} 4652, 8163
Al^{27} 8130
B^{10} 1234
Be$^{7-9}$ 4601, 4615, 5655, 8130, 8192
Cd$^{111, 114}$ 4652, 8163
Cu^{65*} 7243
Er^{167} 4533
F, from Raman spectrum 8110
Ge isotopes 5661
In$^{111, 114}$ 4652, 7221, 8163
Li$^{6, 7}$ 1234, 4615, 5660, 9699
LiF single crystals, relaxation times 3633
Mn^{55} 3638
N^{16} ground state and 3741
Na^{24} 7187
Nd$^{143, 145}$ 1981, 7186
Ne, deuteron bombardment study 9698
O$^{16-18}$ 3741, 5282, 5669
P^{32} neutrinos emission 4667
Rh 1980
Si^{29} 8130
Sm$^{147, 149}$ 7186
Sn^{111} 4652, 8163
Tc^{99} 3695
Th *D* excited states 1969
V^{51}, from paramag. reson. 8036
theory see also *Fundamental particles*; *Nuclear forces*
exchange currents in nuclei 85
nucleon magic numbers significance 538

Nucleus—*contd.*
theory—*contd.*
favoured structures, evidence 539
statistical models 540, 3694
special and magic numbers 541
shell structure, rel. to density 543, 8119
Schmidt model, odd-even isotope shift staggering 545
nuclear states, mixtures hypothesis 547
dipole oscillations, hydrodynamics 1231
size resonances 1232
proton distrib. variation 1236
central nuclear field 1241
100 MeV electrons scattering calc. 1869
finite range interactions effect 1966
closed shells at 20 nucleons 1970
O^{16} photodisintegration 2044
resonance spectra, hyperfine structure 2821
shells, quantum statistical theory 2909
mode of structure partition 2910
deviations from Schmidt limits 2914
d^2, d^3, d^4 configurations 2919
radial integrals for s, p and d shells 2920
asymmetric and symmetric fission, theory 2921
stable isotopes magnetic moments anomaly 2924
triton mag. mom. anomaly 2926
compound nucleus, verification 2991
pair theories, saturation phenomena 3326
shell model, quadrupole moments 3705
ang. correl. phenomena, theory 4114
present knowledge, review 4596
spheroidal model 4599
Li^7, Be^7 spin-orbit coupling 4615
photo-nuclear reactions model 4725
3-, 4-particle, binding energy theory 5124
"independent particle" and "strong interaction" models 5654
magic numbers, mass measts. evidence 5675
radii, potential of even–even α-emitters 5710
l-shells splitting by tensor interaction 6392
shell model, "magic numbers," review 7176
liquid drop, multipole p oscillations 7177
addition energy of neutrons in $h_{11/2}$ shell 7178
e.m. interactions and structure 7179
compressibility and fission asymmetry 7283
Wheeler compounds 8113
Gamow convolutions, low-energy regions 8114
radius of decaying even–even α-emitter 8118
mass differences, shell theory 8887–8
structure hypothesis 8889
binding energies, light nuclei 8892
classification of isomers 8894
nuclear shells, review 8898
interactions with orbital electrons, review 8915
two-body interactions 9270
radiative transition probabilities 9674
Nylon
film, β-ray absorption 2748
abs. energy loss of 18 MeV protons 7956
Oceanography see also *Liquid waves*; *Seawater*; *Tides*
wave motion at a beach 1647, 3377–8, 4147
shadow zone sound 1680
swell, e.m. meas. device 2419
thermopile wave meter 3229
surface waves, linearized theory 3376
refraction of ocean waves 3379
currents, vertical and horizontal momentum concentrations 6639
deep-sea chronology, Ra appl. 7402
tides and similar waves, propag. 7593
local temp. irregularities, effect on sound 8594
Optical films see also *Filters*
Al–Ag, Al–Mg alloys, reflect. coeffs. 225
Ag, Cu and Sn layers, optical properties 227
phase shift, interferometrical meas. 228
Ag, reflectivity 229
absorbing properties, rel. to photophoresis 921
Maxwell equations, quadripole theory appl. 986
semi-transparent, optical constants det. 987
simultaneous thickness and optical const. det. 988–9
stratified, e.m. wave propagation 1199, 2575
reflection phase change invest. 1762
Ag, interferometric invest. 1763

Optical films—*contd.*
- 72-in, high-vac. evaporator for searchlight coatings 2083
- low reflectance, for heterochromatic light 2574
- interference spectrum in i.r. 2576
- TiO_2 2579
- O–Cs, optical character 2694
- 2-component, refraction index meas. 3427
- specified-wavelength filter prep. 3464
- density var. meas. 3470–1
- on glass, interference colour 4306
- complex, interferometry appl. 4307
- metal, reflection phase changes study 4308
- mica-Ag interface, phase change 5309
- metal, absorption phase-change study 5310
- thickness and optical props., phase change method 5311
- reflection-reducing, colour 5313
- Ag, optical const. det. 5316–17
- multiple-layers, light dist. functions 5318
- for objective light-intensity equalization 5341
- use for microscope optics 6915
- transparent, luminescent 7765
- "Majestic C," low refl., on glass 7778
- interferometry tech., review 7780
- metal, on non-absorbing backing 8657
- multiple thin and thick films 8656

Optical images see also *Aberrations, optical*; *Resolving power, optics*
- wave theory, ultrasonic model 919
- 3rd-order errors, Lange's representation 930
- spectrograph bulk radiation imaging 935
- diffraction, light dist. near focus 1773
- improvement, in diffraction microscopy 3474
- transformer, long-slit spectroscopes appl. 4235
- affected by artificial influences in focal plane 4310
- diffraction defects, correction 5321
- longitudinal location, precision improvement 5326
- light intensity equalization 5341
- objects in principal section of system 6097
- aberrational caustics 6828
- partial coherence concept 7782
- theory and calculation 9358–9
- outside focal plane 9360
- phot. objectives, natural vignetting 6912–13, 8668
- microscope, phase contrast, bright field and polarization combination 8670

Optical instrument testing
- photographic lens tester 174
- homogeneity defects, shadow method 244
- ultrasonic method for glass elastic constants 668
- optical flats, by Fizeau fringes 992
- dioptometer, theory and appl. 4325
- design analysis, sources of instability 6158
- adjustable lens holder 6907
- i.r. spectrometer calibration 9362

Optical instruments Other instruments are listed separately, e.g. *Refractometers*
- optically perfect 1004
- binocular, visual space metric appl. 2254
- Kellner-type eyepiece, pupil aberration correction 3425
- linear filter study, opt. method 4317
- dioptometer, theory and appl. 4325
- photographic graininess meas. instr. 4984–5
- precision alignment device for sunlight 5340
- plane diffraction grating copying 6149
- resolving power, theory 6824
- geometrical and physiological magnification 6908
- AgCl corrector plates for Kellner–Schmidt system 7657
- diffract. theory of aberrations 7659
- electro-optical alignment meas. 7577

Optical materials see also *Filters*
- Ag films, reflectivity 229
- Perspex, polarization by scattering 237
- homogeneity defects, shadow study 244
- glasses, elastic and photo-elastic properties 669
- glass, spectral transmission data 762
- plastic crystals optical surfaces 2075
- crystalline, mech. and thermal props. 4229
- Si–Ge achromatic doublet 6827
- sapphire-glass seal, i.r. photocell appl. 6910
- sapphire-glass seal h.f. induction method 6911

Optical rotation see also *Magneto-optical effects*; *Polarimeters*; *Polarized light*
- benzoin rotatory power 240
- rel. to atomic dimension 555
- macroscopic model study 1946
- for He II thickness meas. 2629
- helical rotators, "Hertzian" polarimetry 3650
- macroscopic Cotton effect, radiowave 3651
- magnetic, C–NO_2 rotativity 3688
- quartz, i.r. to $9 \cdot 7\mu$ 4314
- anisotropic media, theory 6154
- liquid crystals 6155
- rotational isomerism, infrared spectroscopic study 7734
- Faraday effect under strain 8864
- absolute configuration, X-ray det. 9161
- benzene and nitrobenzene in CCl_4 9402
- automatic meas. 9403
- rel. to chain configuration, protein solutions 9796

Optical systems see also *Aberrations, optical*; *Lenses*; *Optical images*; *Optical instruments*; *Optical materials*; *Resolving power, optics*
- diffraction gratings and plane mirror 235
- anallactic telescope systems 248–9, 6826
- elliptical astigmatism meas. 929
- aberrational and eikonal coeffs. calc. 931
- use of electrical analogy 935
- perfect optical instrument 1004
- focal length and principal points det. 1714
- spherical waves, focus 1773
- matrix design method 2499
- 3-point alignment, interferometric method 2500, 4225
- new const.-dev. prism arrangement 4226
- lens system diff. correction, 2nd-order terms 4227
- image transformer 4235
- lens, principal planes, geom. construction 5235
- wide-angle objectives, light, intensity equalization 5341
- Seidel formulae after object-ray elimination 6098
- differential correction 6099
- spectrograph illumination, homogeneous light-emitting volume 6161
- optimum aperture, nomogram 6825
- Si–Ge achromatic doublet 6827
- aspheric surfaces, graphical methods 6829
- efficient illumination of graticule 6906
- adjustable lens holder 6907
- AgCl correctors for Kellner–Schmidt system 7657
- 3-mirror combination without coma or sph. aberration 7658
- longitudinal positioning precision meas. 7783
- transmission zone plates appl. 8662

Optics see also *Atmospheric optics*
- parageometrical optics 918
- Bureau of Standards, history 6091
- partial coherence concept 7782
- **geometrical** see also *Aberrations, optical*; *Lenses, mirrors, etc.*; *Optical images*; *Prisms*
  - refraction, incidence/deviation rel. 928
  - 3rd-order image errors 930
  - aspherical objective for c.r.t. 932
  - focal length and principal points det. 1714
  - ray tracing, 4-fig. method 3424
  - sign convention, and symbols, standardization proposals 4224
  - Study's coordinate appl. 6096
  - reflection formulae generalization 6823
  - graphical methods for aspheric surfaces 6829
  - telescopes, astigmatic correction 7797
  - calculations by machine 8613–14

Orbits, astronomical
- motion under force producing accel. $-\mu_1 r^{-2}-3\mu_2 r^{-4}$ 1573
- planetary, laws 2305
- radial retardation planetocentric effect 2313

Oscillations see also *Electromagnetic oscillations*; *Liquid oscillations*; *Piezoelectric oscillations*; *Vibrations*
- aperiodic continuity domain 2294
- periodically-varying parameter, fluctuations 2396
- non-linear, topological methods 2457
- parametric excitation 2460–1
- electromech. in $BaTiO_3$, nature 2677
- calculations, logarithmic chart 3257

- **Oscillations**—*contd.*
  - relaxation, amplitude bounds 3404
  - free and discharge, theory 3405
  - torsional, damping rel. to temp. 3851
  - mag. suspensions, eq. 4176
  - suspension, weight and amplitude dependence 5135
  - study by vector repres., differential eq. 5972
  - in inhomogeneous discrete structures 6079
  - torsional, ferromagnet in field, damping 6505
  - subharmonic, growth 6795
  - rods in surrounding medium, damping 6813
- **Osmium**
  - as superconductor 2703
- **Osmotic pressure** see also *Membranes*
  - Baldes meas. method, modification 119
  - electrical osmosis 331
  - polystyrene mol. wt. det. 1776
  - ionic solutions theory 2424
  - molecular shape determination 2903
  - a.c. fields effect 4152
  - polystyrene solutions 4871
  - effected by permeability 5158
  - high polymer solns., second osmotic coeff. 6067–8
  - osmosis in h.f. field 6069
  - conc. polymer solns., from sedimentation equilib. 6070
  - statist. mech. theory of solutions 6071
- **Oxidation**
  - metals, contact potential invest. 1032
  - catalytic, ammonia, mechanism 1397
  - H_2O photo-oxidation by ceric ions 1433
  - Pb oxide oxidation products 1456
  - by electron transfer excitation 2133
  - Cu, low temp. 3073
  - high-temp., of Fe, nucleation process 3193
  - thin metallic films, meas. 4779
  - Ni and Co, kinetics 5856
  - gaseous methyl ethyl ketone, kinetics 7330–1
  - Ni, Co, role of oxide 7339
  - Mn states, thermodynamics 8281
  - Cu, low-temp., rate anisotropy 9045
  - film formation kinetics, Zn foil 9056
  - olefinic, rate const. meas. by photochem. effects 9057
  - $Fe(OH)_2$, colour change 9371
  - thermal, methylamine 9761
- **Oxide cathodes** see *Cathodes*
- **Oxygen**
  - zero-pressure thermodynamic properties 275
  - neutron scattering 1323–4
  - self-diffusion temp. dependence 2455
  - dielectric properties, microwave meas. 2664
  - analysis by paramag. props. 3890
  - corona discharges study 4405
  - magnetic rotatory power 5618
  - upper atmos. dissoc., self-consistent treatment 7404
  - heat conduct. and viscosity data 7607
  - Faraday effect thermal var. in liq. O 8075
  - self-diffusion coeff. 8568
- **Ozone**
  - vertical distrib. in atmosphere 3975
  - vert. distrib. in atmos., det. by lunar eclipse 4918
  - photochem. reaction with H_2O_2 5869
  - atmospheric, vertical distrib., India 6621
  - gas-phase reaction with NO 7340
  - meas. by spectroradiometry 7656
  - force constants, freq. assign., thermodynam. props. 8099
  - atmospheric, meteorol. significance 9203
- ***p*H**
  - *p*H response Na_2O–PbO–SiO_2 glasses 3142
  - high-acidity and -alkalinity standards and practical scale 3134
  - mobility-*p*H behaviour, organic dispersions 3534
- **Pair creation** see *Electron pairs*
- **Palladium**
  - magnetic susceptibility 5575
- **Paper**
  - gloss measurement 6142
  - phys. props. dynam. meas. by audiofreq. sound 7317
- **Paraffin wax**
  - calc. of surf. tension from contact angle 8558
- **Parallax, stellar**
  - film errors effect 19
  - spectroscopic, review 6001
- **Paramagnetic resonance absorption** see also *Nucleus magnetic moment*
  - in antiferromagnetic matls. 490
  - Mn, hyperfine structure and resonance effects 496
  - relaxation effects 497
  - $MnSO_4 . 4H_2O$ and $MnCl_2 . 4H_2O$ 1185
  - chromic sulphate alums, room temp. 1931
  - 5 chromic sulphate alums, low temp. spectra 1932
  - potassium chromic alum, low temp. 1933
  - nuclear hyperfine structure 2821, 5576, 7089, 7101
  - meas. on small samples 2837
  - r.f. spectroscopy conf. rep. 3428
  - spin-spin interaction influence 3634
  - Kramer's theorem and nuclear effects 3635
  - simplified apparatus 3636
  - Mn fluosilicate and Mn ammonium sulphate, spectra 3638
  - effect on radiowave mag. birefringence 3639
  - K in liquid NH_3 4530
  - at v. low fields 4531
  - metal ammonia solns., v. low fields 4532
  - Er ethyl sulphate, spectrum 4533
  - in rare earth ethyl sulphates 4534
  - in paramag. salts 5573
  - Cu Tutton salts, h.f.s. theory 5576
  - hydrated Co salts 5577
  - microwave freq., in 13 Fe-group salts 5579
  - Cr–K alum spin relaxation 5580
  - electronic resonance optical detect. 5617
  - historical survey 6851
  - atomic nuclei, magnetic-spin reson. study 7085
  - rel. to permeability 7086
  - $MnSO_4 . 4H_2O$ 7087
  - diluted paramag. salts, spin-lattice relaxation 7088
  - h.f.s. in Fe transition group 7089
  - in Fe alums 7090
  - at large magnetic dilutions, Mn, alk. halides 7091
  - microwave spectra K_2CuCl_4 and $(NH_4)_2CuCl_4$, hydrated 7092
  - Ni ions exchange interaction, Ni fluorilicate 7093
  - proton resonance line decomposition 7094
  - $Ni(NH_4)_2(SO_4)_2 . 6H_2O$ 7096
  - microwave, in Mn sulphates 7097
  - alkali metal solutions, low field 7098
  - vanadous ammonium sulphate 8036
  - spectra, 4 Co salts 8037
  - crystals containing colour centres 8039
  - proton, in $HClO_4 . H_2O$, oxonium ion struct. 8843
  - in 3 Cu chlorides 8844
  - salts with large radicals, structure invest. 8846
  - in chrome alums 9599
  - inter-ionic distances and line widths 9600
  - nuclear effects, v. low temp. 9602
  - Cu quadrupole moments 9605
- **Paramagnetism** see also *Magnetic properties*; *Magnetism*; *Magnetization*
  - MnF_2 and ZnF_2 solid soln. susceptibilities 495
  - paramagnetic cupric salts, thermodynamic properties 1183–4
  - susceptibility calc. 2822
  - O analysis by paramag. props. 3890
  - orientation of rod in field 5556
  - hyperfine structure, theory 5572
  - paramag. displacement nuclear resonance freq. 5574
  - paramag. salt demagnetization, nuclei spatial alignment det. 5671
  - Weiss, transition from antiferromag. 6312
  - in αFe_2O_3 6333
  - Fe, Co and Ni ferrites 6341–2
  - and cohesive energy, transition metals 7069
  - dipolar domains at low temps. 7070
  - neutron diffraction of paramag. subst. 7072
  - H and Li ions in soln. 8035
  - statistics of linear macromolecule 8038
  - susceptibility in dil. solns. det., micromethod 8842
  - $CuSO_4$ solutions 9598
- **Particle accelerators** see also *Ion beams*
  - symposium of reviews 3578
  - progress in France 3595
  - current integrator 4444, 7958
  - French atomic synthesis equip. 4445
  - 21 largest, list 4689
  - high-energy, focusing principles 5472

A complete list of the Subject Headings will be found at the end of the Index.

Particle accelerators—*contd.*
theory of voltage stabilizers 7971
atomic physics text-book 8111
linear
500 kV, with Se rectifiers 1116
phase stability rel. to 1st-order focusing 1872
travelling-wave, particulars 4422
microtron, theory 6255
Istanbul 800 kV neutron generator 6480
electron, 6 MeV travelling wave 7005
10 MeV electron accelerator 7932
d.c. generators, review 9535
electrostatic, ion source control 9555
orbital
review 380
model betatron and synchrotron magnet field meas. 381
electron synchrotrons, design 1093
30-MeV synchrotron 1094
f.m. cyclotron, beam oscillations 1117
cyclotron acceleration of C^{12} and C^{13} stripped nuclei 1870
Birmingham proton synchrotron 1871
proton mag. moment det. 1982
ejection of electron beam from betatron 2727
synchrotron–oscillation resonance 2756
effects of gas scattering 2760
betatrons and synchrotrons, resonance damping at injection 3556, 7945
225 cm cyclotron, accel. chamber and dees 3575
electron capture in 30 MeV betatron 4421
orbit-bender for betatron injection 4423
flux-forced, field-biased betatron 4424
400 MeV air-cored proton synchro-cyclotron 4446
cyclotron oscillators design 4447
multiple traversal of targets 4453, 7946, 9532–3
thick target prep. 4778
synchrotron scattering losses 5473
M.I.T. cyclotron instrumentation 5474
cyclotron, — ve ions and charge neutralization 5475
Berkeley cyclotron, r.f. system 5476
experimental electron cyclotron 6256
23-MeV, medical betatron 6666
r.f. requirements of electron synchrotrons 7004
potential field of duants 7943–4
design of cyclotron magnet 8049
medical appl., review 8405
synchrotron with straight sections, forced betatron oscillations 8780
f.m. cyclotron, dee-biasing 8781
pulser for synchrocyclotron 8782
cyclotrons, review 9534
Particle size see also *Area measurement*; *Surface measurement*
airborne particle sampling device 654
growing particles, interference 655
distribution, influence on suspensions viscosity 865
mineral colloids, from X-ray scattering 1088
distribution law 1338
aersols, temp. effect 1440
and time-lag in AgI ice precipitation 1545
effect on diffracted X-ray power 2169
rel. to viscosity and sedimentation in suspensions 2408
rel. to coercive force in powdered alloys 2841*
sieve analysis methods 3059
distribution calc. 3060
latex, X-ray diffraction 3076
resin-bonded materials, effect on mechanical props. 3828
X-ray scatt. of colloidal Au and C 3869
atmospheric salt nuclei, rel. to i.r. transmission 3988
distributions in polydispersed systems 4856
in thixotropic suspensions 4857
rel. to scattering intensity, colloids 5330
det. in suspensions, from scattered light polarization 5334
coiling polyelectrolytes light scatt. studies 5892
αFe_2O_3, rel. to mag. props. 6333
suspensions of spheres, effect on viscosity 6769
ferrites, effect on dielectric and magnetic props. at h.f. 7839
effect of Gaussian dist. on flow birefringence 7787
Particle size—*contd.*
NH_4Cl λ-point hysteresis 7811
distribution in grinding 8269
agglomeration in W metal powders 9737
meas. methods and fluid dynamics 9738
Particle track photography see *Cloud chambers*; *Photography, particle tracks*
Particles see *Fundamental particles*; *Scattering, particles*
Pathology
I^{131} clinical diagnosis 2265
Pendulums
torsional, suspension strips 5135
gravity meas., elasticity corrections 9252
recording, torsional, for shear modulus 9745
Periodic system see also *Elements*
nuclear mag. resonance, rel. to position 1976
regularities, quantum statistical basis 2909
transition elements, metallic state, valencies 9092
Permeability, magnetic see *Magnetic properties*; *Magnetization*
Permeability, mechanical see also *Diffusion*
glass wool and other highly-porous media 3065
fluid flow through metals 4144
effect on osmotic press. 5158
H through Zr 7302
Permittivity see *Dielectrics*
Phase-contrast microscopes see *Microscopes, phase-contrast*
Phase equilibrium see also *Solubility*; *Solutions*
Schreinemakers's distillation theorem 689
critical points theory 2585
Co transformation theory 3908
in ordering alloy system 3911
inorganic, C^{14} isotope effect 4812
meas. by critical flow orifice 5847
He, solid-fluid, above 5 000 atm. 6168
phase change, statist. mech. 6187
alloy boundaries det., diffusion technique 7304
phys. chem. textbook 8280
eutectic mixtures solvent-electrolytes 25°c to — 73°c 9321
ethylene–CO_2 flash latent heat 9758
binary systems
Ni–Co alloys, lattice parameters 749
U–Mo alloys 773
U–Fe system 774
liquid-vapour, critical behaviour 1666
critical phenomena review 1798
in BaO reduction by C 1837
H–Ti, thermodynam. invest. 2115
2-component liquid system, opalescence 2586
KCl and KBr mutual solid solubilities 3109
ideal and pseudoideal mixtures 3110
acetylene–CO_2, –ethylene and –ethane low temps. 3111
Co–Cr system sigma-phase, structure 3912
BaO–TiO_2 system 4813
metastability, critical limits 5848
α, α' phases in Al–Zn system 8406
Fe–N, prep. and cryst. structures of γ and α 8407
Fe in Cu, solubility 9014
Te–Si alloys study 9739
CO_2–ethylene and CO_2–propylene 9756
latent heats calc. 9757
ternary systems
N_2–H_2–NH_3, gas-liquid equilib. 3852
quaternary and higher systems
quaternary equilibria. data 3113
Phase transformations see also *Thermal transformations*
polymorphic, influence of adsorption 716
$BaTiO_3$, O displacement 1042
oxide mixtures, rel. to catalytic activity 1419
critical phenomena review 1798
liquid-vapour, critical temp. 1799
in metals, statistical theories 2074
Ni amalgams., irreversible transition 2612
NH_4NO_3, anomalous 2613
NH_4NO_3, effect of ultrasound 3410
Stephan's linear problem, alternating phases 3482
in Co, theory 3908
long-range order in beta-brass and Cu_3Au 3910
in ordering alloy system 3911
low-temp. yellow P transition 4338

Phase transformations—*contd.*
  WO_3 6585
  quartz α/β, adsorption effect 6925
  rate in organic subst., ultrasonics effect 7329
  bariumdicalcium–propionate, transition 7806
  Teflon 7807
  solid-gas, mass transfer rate 7810
  pure subst. in solid solns. and double salts 8320
  CsCl, lattice structure changes 8356
  ζ-phase struct., Ag–Zn system 9146
  X-ray study on $PbZrO_3$ 9149
Phonographs see *Sound reproduction*
Phosphorescence see *Luminescence*
Phosphoric acid
  films, use as hygrometer 9797
Phosphors see *Fluorescent screens*; *Luminescence*
Phosphorus
  yellow, transition at low temp. 4338
  diffusion in NaCl 6490, 8241
  compounds, Raman spectra 6891
  photoconductivity, charac. 6972
  solubility of Hg in liquid P 7603
  liquid, supercooling 7809
  crystallization velocity 8337
Photochemistry see also *Photographic process*
  Hg-photosensitized atomic H/CH_3Cl reaction 705
  photopolymerization of styrene 707
  H_2O photo-oxidation by ceric ions 1433
  active N and Na, K and Sb, energy transfers 1435
  atmospheric water vapour 1534
  electron transfer and interaction absorption 2131
  collagen structure, electron irradiation effect 2132
  oxidation by electron transfer excitation 2133
  glass-rod u.v. radiation integration 2197
  $FeCl_4^-$ photoreduction in alcohol 3147
  water reduction by Eu II ion 3148
  vinylidene chloride photopolymerization 3149
  luminescence and ionization accompanying quinine sulphate hydration 3463
  native proteins 3866
  acetaldehyde high temp. photolysis, rate constants 3867
  acetone vapour fluorescence 4291
  methylcyclopentane reaction with Hg $6(^3P_1)$ atoms 4821
  H atoms abstraction from paraffins 4845
  H atoms abstraction from olefins 4846
  abstraction of H from cyclic hydrocarbons, etc. 4847
  Hg sensitized high-temp. butane decomp. 4848
  formaldehyde vapour photolysis, 3 130 Å 4849
  Hg sensitized methyl chloride decomp. 4850
  Hg sensitized propane decomp., high temp. 4851
  Hg sensitized ethane high temp. reaction 4852
  rate constants det., "high" O pressures 4853
  quantum theory appl., review 5845
  toluene, mesitylene and ethylbenzene, photolysis 5867
  Hg photo-sensitization, radicals decomp. 5868
  O_3–H_2O_2 gas phase reaction 5869
  methylamine photolysis, temp. effect 5870
  KCl and KBr, irradiated crystals, u.v. absorption bands 5871
  photographic emulsions, photosensitivity mech. 6668
  photopolymerization, refractometric invest. 6834
  bromination of neopentane 7349
  AgI nuclei, photolytic inactivation 7350
  phys. chem. textbook 8280
  action of light on colouring matters 8300
  Hg diethyl. photolysis 8301
  acetaldehyde photolysis 8302
  neopentane and H bromination 8303
  olefinic oxidations, rate const. meas. 9057
  chain reactions, wall effects 9068
  Cl atom reactions, chain termination mech. 9069
  of atmospheric O_3 9203
  H_2O_2 decomp. by high-energy X-rays 9772
Photoconductivity
  semiconductors, ionizing radiations effect 315
  semiconductors, invest. 1833
  fundamental invest. 1839
  ditto, Cu_2O appl. 1840
  i.r., valence intermetallic compds. 5414
  crystals, ionization mech. 6136
  exciton theory 6221
Photoconductivity—*contd.*
  triphenylamine dyes 6224
  semiconductors, relaxation 6225
  cell for visible and u.v. spectroscopy 6838
  relaxation, compared with phosphorescence relaxation 6885
  i.r. photocells, sapphire-glass seal method 6910
  p–n junction transistors 6965
  performance limits 6970
  composite photo-emissive cathodes 7896
  barrier layer rectifiers 9480
  Ag halides, rel. to *F*-centres 8343
  Ag halides, relaxation props. 8739
  alkali–Ge compds., photo-effect 317
  As, energies 6972
  B, energies 6972
  BaO 7693, 7884, 7898
  Bi_2S_3, Bi_2Se_3, Bi_2Te_3, i.r. 7885
  C (diamond), energies 6972
  CdS, low temp. 5415
  photocond. CdS prep. 6223
  Ge, energies 6972
  I, energies 6972
  in Mg_3Sb_2 layers 1843
  P, energies 6972
  PbS cell in radiation pyrometer 5366
  PbS photo-resistances, characteristics 6977
  PbS long-period photo-effects charac. 7894*
  PbS cells, sensitivity and response time 7895*
  PbS, PbSe, PbTe 192, 7885
  PbS and PbTe detectors, sensitivity limits 1841
  Pb sulphide and telluride, temp. dependence 7870
  in Pb telluride, i.r. 6974
  S, energies 6972
  Se photocells 2697
  Se coatings 4387
  Se rectifiers time-lag effect, origin 6217
  Se (red), energies 6972
  Se single crystals 6975
  Se rectifiers recovery 6976
  Se blocking-layer cells invest. 7871
  Si, energies 6972
  Te activation energy changes 1061
  Te, energies 6972
  TiO_2, rel. to absorption 6855
  Tl halides, rel. to *F*-centres 8343
  Tl_2S cells 4388
  ZnO 7867
  comparison with luminescence, ZnS 6886
Photoelasticity
  recent developments, conference 100
  optical glasses 669
  diamond 996
  stress det. in powdered mass 1780
  polyethylene, hysteresis 3469
  quenching stresses study 3815
  stress meas., symposium 3814
  stress trajectory curv. meas. 6046
  $NaClO_3$, constants 6153
  3-dimensional 6903
  fracture analysis, metals and methyl methacrylate 8276
  Faraday effect under strain 8864
  equilib. state decomp. intoholomorphic function derivs. 9024
  invariant contour integrals 9401
Photoelectricity see also *Photoconductivity*; *Photovoltaic effects*
  photo-electric polarimeter 242
  Se photocells, spectral sensitivity 316
  KI *F*-centre emission 318
  image converter, chromatography appl. 728
  nuclear track density meas. 778
  photomultipliers, spectroscopic appl. 936
  phototube/oscillograph excitation energy det. 943
  Se spectral sensitivity, rel. to current and load resistance 1060
  Cs–Sb layers emission 1062
  Ba film photo-adsorption 1119
  p.e. effect in G.M. counter discharge 1121
  multiplier phototube in scintillation counters 1130
  photoeffect in Ag halide layers absorpt. 1764
  surface effect 1842

Photoelectricity—*contd.*
current/time rel., alkali-halide crystals 1844
SrO and BaO, changes due to u.v. irradiation 1845
A counter pulses 1879
high-sensitivity compensation for radiation meas. 2489–90
u.v. photon counting, electron multiplier 2498
O–Cs films, invest. 2694
2nd-order effect, below threshold 2695
light-sensitive resistors, appl. 2696
crystals, *F*-centre non-radiative transitions 3196
superficial p.e. effect in ferromagnetics 3629
rapidly changing mech. quantities meas. 4132
ext. photoeffect in CuO and Cu_2O 4386
Na and K emission, new aspects 4389
enhanced emission effect, Ba oxide 4390
external photoelectrons from RbI F' centres 4391, 6973, 7900
alkali halides exciton-enhanced emission, mech. 4392
contact separation, elec. transients correl. 4393
mag. electron multipliers for pos.-ion detection 4394
star scint. observations 4947
cathode-follower balance indicator 5230
photocell multiplier spectrograph attachment 5243
high temps. det. 5367
i.r.-sensitive photocells, review 5413
curr.-volt characteristics, mag. field effect 5416
p–n junction photo-cell 5417
Ag films on NaCl 5906
X-ray fluorescent image intensification 5960
electrophotoluminescence study 6139
image-converter tubes for multiplier photocells 6222, 8741
coloured liquids fluorescence spectra meas. 6890
electron multipliers, review 6971
astron. appl., photomultipliers positional effect 7476
BaO 7898
AgBr, AgCl, rel. to absorption 7899
photomultiplier tube sensitivity, time-dependence 7901
photo-ionization cross-section, B to Ne 8143
ditto, alkali metals 8144
meteor observation apparatus 8441
photocathode image formation, photographic appl. 8607
Tl halide salts sensitivity 8738
AgI, rel. to photographic props. 9222
colorimetric comparator 9405
Sb–Cs photocathodes spectral charact. in u.v. 9481
ditto, Sb–K and Sb–Na 9482
electrode emission effect on discharge rectification 9503
alkali metals light absorption effect 9626
image phototube as high-speed shutter 9890, 9903

Photogrammetry
precision measurement, review 2289
errors theory in radial triangulation 6013

Photographic light sources
electronic spark generators 4025
power stroboscope for high-speed flash 4026, 9904
flash unit for ballistic photography 4980
cloud-chamber photog., triggering circuit 5502
for high-speed photography 7443
for document study, filters 7688
index for illuminants colour 8666

Photographic materials
nuclear emulsions, swelling temp. coeff. 775
ionizing-particle-sensitive, continuous prep. 2271
sensitizing dyestuffs use, survey 2272
latent image fading, thermal mechanism 2283
Ilford E-I emulsions, grain counts and range/energy curve 2284
emulsions for photographing high aerial objects 3249
industrial radiography films 4017
X-ray film sensitometry 4019
nuclear emulsions, latent image fading 4020
graininess meas., variable-magnification instr. 4984–5
granularity meas., microphotometer 5231
granularity defin., meas. 6670
survey of recent theory 7441
emulsions activation by ultrasonic waves 7633
u.v. spectroscopy emulsions, review 7668
emulsion charac. for diff. exposure times 8412

Photographic materials—*contd.*
high-intensity reciprocity failure of int. image 8415
emulsions, effect of press. and friction 8417
emulsions comparison on deuteron bombardment reaction 9538
developers for hot-drum machines 9891
nuclear emulsions shrinkage factor meas. 9892
capacitance meter for emulsion thickness meas. 9894
cylindrical supports, nuclear emulsions 9902

sensitivity
spectral sensitivity invest. 2270
emulsion calibration 2273
latent image centres dissolution and spectral photosensitivity 3248
high-sensitivity layers, anomalous ageing 4018
spectroscopic plates, pre-exposure criteria 4236
Ag halide emulsions, super- and antisensitization 4981
light-sensitive layers sensitometry 5962
sensitization and desensit. by pyrimidines or purines 5963
quantum theory of exposure 5964–5
for 20-MeV X-rays 6669
nature of photosensitivity 6668
intermediate intensity reciprocity-law failure 8413
Ag halides photo-conduction relaxation props. 8739
to electrons 8779
AgI, rel. to light absorption and internal photo-effect 9222
chemical sensitization, spectral sensy. 9893
quantum yield of X-rays 9900

Photographic process see also *Photochemistry*
image calibration during exposure 926
Ag halide layers, light absorption 1764
inflammable P appl. in i.r. 2288
colloidal Ag colours from black and white image 2290
Herschel effect and prior illumination sensitization 4986
gradation in electron-microscope picture 5460
sensitization and desens. by pyrimidines or purines 5963
image dimensions rel. to exposure 5966
latent image, sensitization, *F*-centres, theory 7441
alkali halides, caused by electron bombardment 8253
emulsion charac. for diff. exposure times 8412
blackening rel. to exposure 8414
review 9895
quantum yield of X-rays 9900

development
i.r. radiation and intensification effect on latent image 1554
electron microscope study 1555
electrosynthesis, coloured images 2269
latent image, i.r. action, role of dyes 2274
pressure and friction effect on emulsion 2275, 8417
Ag filaments and dendrites 2276
nuclear track differentiation 2281
density rel. to exposure, quantum theory 5964–5
thick nuclear research emulsion 5967
int. image high-intensity reciprocity failure 8415
latent image formation 8416
developers for hot-drum machines 9891

Photography see also *Cameras*; *Cinematography*; *Lenses*; *Radiography*
field depth, graphic calc. 2268
darkrooms illumination 2270
high-altitude aerial objects 3249
resolving-power meas. cameras 4979
underwater, camera window 5961
weakly illuminated objects, photocathode method 8607
optimum lens-film combination resolving power 9889

applications see also *Photogrammetry*
astron. parallax measures, errors 19
displacement/time recording 863
X- and γ-ray meas. 2726
ultrasonography 4179
electron microscope exposure meter 4437
nuclear induction signals recording 4612
luminescence, viscosimeter recording apparatus 4987
W ribbon lamp calibration 5365
air photog., fine-detail brightness 5969

Photography—*contd.*
  applications—*contd.*
    aircraft camera mounts 5970
    recording explosive wave outside linear charge 7337
    c.r.o. recording, speed det. 7442
    combined stage and focus control for photomicrography 8669
    sound- and microwave space patterns display 9352
    shadow-casting method in photomicrography 9411
  colour
    spectral energy distribution 762
    colour temperature meter 924
    reproduction processes 1557
    image production by electrolysis 2269
    sensitizing dyestuffs evolution 2272
    natural, in colloidal Ag 2290
    equiv. densitometer 4983
    concentration and luminance diagrams 5337
    quality evaluation 6905
    colour photomicrography, transmitted light 8418
    index for illuminants colour 8666
    Schlieren colour micrography, phase-contrast method 8670
    multi-layer films, theory of density 9906
    diffusion in multi-layer materials 9907
    photometer, sliderule 9908
  high-speed see also *Cinematography*
    lightning photography 765
    ballistic, Kerr cell camera and flash unit 776
    detonation study 3122, 3128
    fast transient phenomena study 3129
    ultra-high speed recording 4024
    electronic spark generators 4025
    flash, new power stroboscope 4026, 9904
    ballistic, flash unit 4980
    bibliography 4989
    Kerr cell appl. 4990
    image converter tube appl. 4991, 9890, 9903
    stereoscopic schlieren system 4992
    source of light in explosion photographs 6524
    techniques, survey 7443
  infra-red
    flashing phosphor appl. 2288*
    solar protuberances phosphophotography 3267
    turbid atmosphere visibility 3987
  particle tracks
    cosmic rays, curvature invest. 467
    cosmic-ray stars invest. 599, 600, 2811
    emulsions swelling temp. coeffs. 775
    track density, photoelectric meas. 778
    atmospheric radioactivity meas. 1264
    particle identification 1556, 2285
    fast electron multiple scattering 1868
    emulsion response to high-energy photons 1878
    gamma-ray stars 2029, 5768
    due to high-energy particles, structure 2030
    background fog reduction 2277
    particles, relativistic ionization increase 2278
    heavy nuclei, thinning; rel. to atomic weight 2279
    slide rule for calculations 2280
    differentiation by double development 2281
    accuracy of depth meas. 2282
    latent image fading 2283, 4020
    Ilford E-1 emulsions, grain counts and range/energy curve 2284
    energy losses in plate at relativistic velocities 2286
    cosmic-ray effects, reproductions 2801
    for U and Th det. in rocks 2936
    350- to 400-MeV proton stars 2998
    neutron and proton stars, hammer tracks 3006
    150 MeV-neutron stars 3036
    Li^6 *n*-meas. technique 3055
    back diffusion, geom. calc. 3571
    meas. of scattering 3580
    photons, deuterons, tritons, α-particles, range-energy rel. to emulsion composition 3581
    showers, study at 28 000 m 3610
    star prongs, ang. dist. 3619
    semi-automatic analysing device 3759
    U fission fragments ranges 3784
    electron-track radiography, liquid-emulsion methods 4021

Photography—*contd.*
  particle tracks—*contd.*
    track autoradiography with Fe^{59} and S^{35} 4022
    special cosmic-ray emulsions 4023
    cloud-chamber tracks interpretation, multiple scattering study 4451
    emulsion sensitivity var. with alt. 4510
    electron pair scattering from (Li, *p*) gamma-rays 4685
    Q-values for (α, p) on Al and B 4965
    Li analysis in minerals 4884
    nuclear multiple plate camera 4988
    proton range energy rel. 5482, 8790
    charge and energy det. 5532
    cosmic-ray lat. effect, studies 5533
    cosmic-ray nucleon-nucleon collisions 5543
    emulsion scanning apparatus 5731, 9901
    scattering meas., elimination of spurious 5732
    high-energy particles, multiple scattering meas. 5733
    light nuclei stars, Fermi's statist. method appl. 5736
    π^--mesons, nuclear interactions 5738
    photo-nuclear stars in emulsions 5762
    stray X-ray and gamma-ray monitoring 5957
    processing thick emulsions 5967
    heavy charged particles energy meas., impregnation method 6269
    range-energy rel., protons and α-particles 6270, 7957
    thinning-down effect 6271
    special emulsion detection of rare α-activity 6401
    $(n, p; \pi^-)$ example 6467
    liquid emulsion appl. 6671
    positron scattering at 105 and 185 MeV 7941
    multiple Coulomb scatter meas. 7953
    scattering const. values 7954
    α emitters quantitation in bone 8154
    wire loading of emulsions 8182
    highly ionizing particles study 8183
    high-energy proton Coulomb scattering 8785
    2-pronged stars 8787
    α-particle range-energy curve, Kodak NTA emulsion 8789
    Q-values meas. for (α, p) reactions on Al and B 8958
    proton spectrum by stacked plates 8976
    $\pi^+ \rightarrow \mu^+ \rightarrow \beta^+$ study 8993
    electron tracks eradication 9223
    overlapping cells sampling method 9231
    gap meas. in electron sensitive emulsions 9527
    nuclear emulsions comparison, *d* bombarded Be 9538
    stars due to C ions from cyclotron 9683
    protons and mesons 9720
    review of technique 9896
    cylindrical emulsions 9902
Photometers see also *Spectrophotometers*
    electron microscope exposure time 927
    photoelectric, light-scattering, for high mol. wt. det. 1777
    simple recording microphotometer 2497
    stellar, photoelectric 3269
    flame, integrating 3423*
    polarization, accuracy 4221
    micro-, projection, improved slit 4223
    tristimulus type 5229
    microphotometer for photographic granularity det. 5231
    stellar, photoelectric 7455
    for t.v. image contrast meas. 7655
    Barnes colorimeter, circuit 7794
    photoelectric, for Na *D* line twilight emission 8384
    micro-, area determinator 8541
    electronic whiteness meter 8611
    units for infrared spectrographs 5232
    colour photography exposure meter 9908
Photometry see also *Brightness*; *Densitometry*; *Illumination*; *Spectrophotometry*
    curve computer 14
    survey of practice 176
    photoelectric, double star colours and mag. 816
    near galaxies study 1586
    photographic, v. low brightness 1712
    new modulated W filament device 1713
    telescope luminosity invest. 1787
    separator for visual spectrophotometry 2493
    heterochromous, 3-line method for curves 2494
    fluorescent luminaires 2495

Photometry—*contd.*
  galvanometer scale for direct reading 2496
  of galaxies, Fabry method 3268
  electronic differential nephelometer 3468
  sky light 4917
  extra-galactic nebulae, Schilt method 5009
  photoelec., cathode-follower balance indicator 5230
  light-intensity equalization, wide-angle objective 5341
  photoelec. spot analysis Sb and Bi 5899
  photoelectric stars and nebulae 5981
  heterochromatic, with rotating filters and colour wedge 6094
  candlepower standards horizontal dist. det. 7654
  contrast meas., t.v. images 7655
  photographic, blackening rel. to exposure 8414
  low-level, graphical methods 8610
  eye photometric props. var. 9870
 light sources
  W, adjust. temp. standard 5227
  constant luminance method 6095
Photons see also *Cosmic rays, photons*; *Gamma-rays*; *X-rays*
  longitudinal and scalar, new treatment 69
  from proton and anti-proton 70
  meson production 82, 2063
  ditto, spin zero 1317
  ditto, positive, on H 2060
  ditto, scalar and pseudoscalar 5794
  tensor equations, geometric demonstration 845
  negative-energy hypothesis 1611
  polarization correl. of mixed multipoles 1968
  emission, relativistic quantum theory 2364
  self-energy in quantum field theory 2370
  u.v., electron multiplier counting 2498
  distrib. over quantized radiation field states 3323
  emission by relativistic charged particles in mag. field 3574
  impossibility of location or no. calc. 4109
  probability of passing optical device 4217
  transmission probability, thick, heavy matls. 4675
  high-energy, transition curves 5766
  secondary-electron photon recorder 6282
  emission from radiowave sources 7111
  e.m. wave-fields, quantum props. 7521
  non-vanishing mass 7525
  soft photon emission in radiation processes 7532
  scattering by bound electron 8148
Photophoresis
  discussion of mechanism 171
  effect combined with h.f. electric field 920
  rel. to thin layer absorbing properties 921
  positive and negative, theory 4218
  coloured fog, particle speed invest. 5223
  transverse, invest. 6822
  particle motion in gravitational, electric, magnetic and e.m. fields 7649
  in very high vacuum 9355
Photovoltaic effects
  electron voltaic effect 7021
  Zener current in Ge *p–n* junctions 7897
  Si *p–n* junction, current amplification 8740
Physics
  abstracting, investigation 1593
  and communication theory 1594
  physical theories, geom. structures persistence 4071
  physical concepts system, structure 6720
  atomic, textbook 8111
  American exptl. methods, recent trends 8489
  a unified approach 8490
  fundamental and derived quantities 8491
  suggested teaching improvements 9253–4
Physiology see also *Biological technique*; *Blood*; *Electrobiology*; *Hearing*; *Vision*
  nerve fibre, stimuli propagation 9865
  radiation from human body, meas. 9654
Piezoelectric oscillations
  equations of state, transducer appl. 142
  X-cut quartz sound field 155
  interference obs. of plates 3407
  contour modes of square plates 5174
  vibrating square plates, behaviour 7844
Piezoelectric oscillations—*contd.*
  vibration amplitude meas., interferometric 8590
  mechanical breakdown limit 9353
  change of freq. with pressure 9454
Piezoelectricity see also *Electrostriction*
  crystals, ultrasonics appl. 302
  quartz coeff. temp. dependence 1046
  underwater point-source probe 1679
  quartz cryst. const. det. 1823, 9455
  quartz crystal blanks ageing 1824
  quartz vibrators (book) 2459
  ultrasonic transducer, practical design method 2472
  Rochelle salt, effect of purification 2668
  crystals, commercial prep. 2675
  quartz oscillator-plates manufacture 2676
  $BaTiO_3$ single-domain crystals, response 2678
  low-loss crystal systems 2849
  rapidly changing mech. quantities meas. 4132
  variable resonant freq. cryst. transducers 4201
  ZnS, calc. 5398
  piezo- and electro-optic eq., tensor form 6206
  efficient ultrasonic radiators 6809, 7641
  Seignette salt characteristics 6955
  new detection method 7843
  meas. of internal friction 8257
  loss due to dipoles rotation 8725
  forces, direct calc. 9451–2
  lead zirconate 9453
Piles, nuclear fission see *Nuclear fission reactors*
Planets see also *Astronomical spectra*; *Solar system*
  atmospheres, reviews 25, 7460
  Mars, structure and composition 1580
  of solar system, origin 1578, 5014
  distances and rotation, laws 2305
  dust-cloud condensation origin 2317
  properties of clouds from which formed 2318
  planetary atmos. diffuse reflection 2322
  Venus and Earth, inner core theory 2323
  separation from sun hypothesis 3272
  small planetary cores, instability 3274–5
  atmospheres, dissipation 3276
  Mercury, atmosphere 3277
  structure, hydrodynamics 4067
  Mars atmos., scattering particles 5016
  Mars, atmos. press. det. 5017
  rel. to white dwarfs 5046
  collision with interplanetary matter 6681
  interplanetary matter 7459
  stability of Saturn's rings 7461
  Saturn rings mass, particle size 7462
  evolution by non-elastic collisions 8448
  evolution of protoplanets 9235
  large, internal constitution 9236
  Mars polarized light interpretation 9237
  solar system positions correl. with ionospheric disturbances 9863
Plastic deformation see also *Slip*
  metals, effect of preparation 674
  mild steel, optical study 675
  plane, approx. solns. 677
  mild steel residual strains 678
  propagation in solids 680
  creep rate and secondary effect 688
  rupture mechanisms in metals 1366
  two-phase alloys 1367
  theories survey 1369
  deviations from Hooke's law 1370
  diaphragm bulging, theory 1371
  deformation textures in metals 1373, 9030, 9752
  metals, survey 1374
  Fe, by Piobert lines, effect on cathodic H charging 1486
  disk compressed beyond limit 2093
  hardening and relaxation as basic phenomena 2095
  Cu, energy absorption 2096
  infl. of speed, theory 2097
  correspondence principle for monocrystals and isotropic bodies 2098*
  preceding failure 2099
  deformed grain structure 2100
  effect of workhardening 2101
  high-purity Cu creep 2110
  single crystal microhardness var. 2111

- **Plastic deformation**—*contd.*
  - partly plastic thick tube under int. press. 3084
  - Al crystal discontinuous elongation 3093
  - visco-elastic behaviour 3094–5
  - dist. in Fe under tension 3096
  - theory for soft metals 3097
  - dynamic, of thin diaphragm 3099
  - rotational slip in crystals by abrasion 3190
  - polyethylene, birefringence study 3469
  - polycryst. materials, effect on magnetic props. 3631
  - Al monocrystals, effect on X-ray scattering 3803
  - H segregation effect in Fe and steels 3824
  - single-crystal recovery 3826
  - fundamentals of cold working 3829
  - Boltzmann's superposition theory, reversible β flow appl. 3830
  - lattice transformations, temp. interval 4795
  - lattice transformation rel. to slip 4796–7
  - non-linear elast. theory 4798
  - tensile, transverse stresses 4801
  - yielding resist., effect of free surface 4803
  - Au wire, high temp. 4807
  - polycryst aggregate theory 5831
  - Pb and Cu single crystals 5832
  - metals, fatigue mechanism theory 5834
  - cell mechanism and boundary micro-flow 5839
  - Lüders deformation characteristics, steel 6510, 9749
  - in surface-active media, cryst. change 6511
  - bending theory, m.s. beams appl. 6512
  - Al, recovery, recryst. 6513
  - longitudinal waves in bar with strain-rate effect 7322
  - anelastic effects from precip. in Al–Zn alloys 7323
  - visco-elastic solid, additional binding forces 7324
  - metal physics progress 7439
  - thin tubes, combined bending and twisting 8265
  - Fe, heterogeneity, rel. to cold working 8266
  - plastic-rigid body at yield point 8267
  - compression between flat dies, theory 8268
  - resist. of metals at 10^{-6}–10^{2} m/sec 8275
  - metals, method for X-ray microscopic study 9017
  - elast. mod. dispersion with periodic deform. 9028
  - strain rate effect in Al single crystals 9029
  - effect on Cu single crystal internal friction 9040
  - steel, grain-boundary theory 9750
  - thermodynamics of 9751
  - rubber relaxation spectrum 9753
  - of body, due to exploding charge 9755
- **Plastic flow**
  - cast iron flow and fracture 676
  - plane, approx. solns. 677
  - Pt wires 1368
  - frictional and viscosity coeffs. 1372
  - influences on alkali halide crystal properties 1477
  - Rehbinder effect invest. 2112
  - Cu alloys, correl. with conductivity 3098
  - methyl methacrylate 3823
  - and thixotropic flow, mech. 3825
  - reversible β flow, Boltzmann's superposition theory appl. 3830
  - friction surface welding 3847
  - nonclassical reaction kinetics 4806
  - Au wire, high temp. 4807
  - plasticine as model of metal 5830
  - metals creep theory 6515
  - polycryst. Pb, surface effect 6516
  - transient creep in pure metals 7327
  - elastic dispersions, flow props. 9027
  - Fe–Co–Cr–Ni alloy creep invest. 9033
  - metals, dislocations theory 9748
  - pseudoplastic flow, viscosimeter meas. 9295
- **Plasticity** see also *Rheology*
  - wool 679
  - effective stress and strain theory 681
  - plastic bodies viscosity and friction 1372
  - crystals, resolved shear stress 3092
  - methyl methacrylate, invest. 3823
  - lattice transformation rel. to gliding 4796–7
  - Schnadt notch test, theoretical basis 4799
  - elasto-plastic equilib. theory, pract. appl. 4802
  - mathematical theory 5829
  - crystals, dislocations significance 6569
  - cold-worked metals recovery process 7326
  - flow of glaciers and ice-sheets 7401
- **Plasticity**—*contd.*
  - extensions of elementary theory 8264
  - plastic-rigid body at yield point 8267
  - lattice states dislocations theory 9129
- **Plastics**
  - elastic consts. and losses, meas. 6508
- **Platinum**
  - film, as orientated overgrowth 1350
  - wires, plastic flow 1368
  - hydrogenation catalyst, poisoning 1424
  - liquid He film transfer 1804
  - high-temp. resist. 4377
  - high-temp. struct. and thermal expansion 4908
  - magnetic susceptibility 5575
  - Poisson's ratio from elect. meas. 7319
  - evap. film, elec. cond. 7887
  - effect of deformation on elec. resistivity 9496
- **Pleochroism**
  - near i.r., linear polymers 4287
  - planar complexes dichroism 5290–1
  - crystallography with polarized i.r. 5909
  - molec. orientation and light absorption 6131
  - aromatic molec. compds., peculiarity 6132
  - nucleic acid dichroism 7661
  - stretched films, u.v. 8646
- **Plutonium chloride**
  - magnetic susceptibility 8845
- **Plutonium fluoride**
  - magnetic susceptibility 8845
- **Polarimeters**
  - photo-electric, in corona spectrophotometer 36
  - recording, photo-electric 241–2
  - Hertzian, for macroscopic model study 1946, 3650
  - complex reflection coeffs. ratio det. 4304
  - Mars, atmos. press. 5017
- **Polarized light** see also *Double refraction*; *Optical rotation*; *Photoelasticity*; *Polarimeters*
  - by Perspex scattering 237
  - labradorite phenomena 733
  - parallel Nicols, colour sensitivity 994
  - polarizing microscope for − 130 to + 35°c 1006
  - depolarization by shellac solns. 1775
  - crystal growth rate det. 2158
  - sky, spectral dist. 2221
  - sunlit sky, theory 2222
  - and human eye 2242
  - half-shadow plate compensator arrangement 2592
  - examination of metals 3465, 4302–3
  - canal rays, values calc. 4457
  - interference polarizers, multiple-layers 5318
  - due to spherical particle scattering, coeffs. 5334
  - crystals sensitive colour, rel. to colour temp. 5336
  - use in phase-contact microscopy 6160
  - sky, direction var. at 20 000 and 40 000 ft. 6643
  - wide-angle polariscope with doubling analyser 6904
  - e.m. wave analogue 7126
  - daylight sky, 18 000 ft. to 38 000 ft. 7419
  - N.G.C. 7023 diffused light 7481
  - gases depolarization factors 7784
  - chromatic polarization, sensitive colour 7786
  - Zr hydroxide gels, opt. props. 8309
  - blue sky polarization in zenith 8383
  - from Mars, interpretation 9237
- **Polarography** see *Chemical analysis, polerographic*
- **Polonium**
  - segregation in Pb–Bi alloys 8240
- **Polyethylene**
  - proton magnetic resonance 1226
  - crystallinity-temp. rel. 2186
  - stress birefringence 3469
  - infra-red spectrum 6378, 7707
  - dynamic elast. var. with strain 7315
- **Polymerization**
  - styrene photopolymerization 707
  - under H-ion influence 722
  - acetaldehyde, initiation 723
  - copolymerization, styrene/butyl-acrylate system kinetics 724
  - acetaldehyde, rel. to crystallization conditions 725
  - insulator oxide catalysts 2124
  - *iso*butene by α-particles 2135
  - vinylidene chloride photopolymerization 3149
  - linear polycondensing systems 3176

Polymerization—*contd.*
polydecamethylene adipate ring-chain equilib. 3177
non-stationary state invest., diel. method 3509–10
rates, diel. method 3511
alpha-methylstyrene heat of polymerization 3882
catalysed, of gaseous formaldehyde 3883
styrene, catalysed 4823, 4837, 5857
rel. to sp. heat 4875
butadiene, CH_3-induced 6528
metallic mineral salts, l.v. absorpt. spectrum det. 7731
by α-particles, liq. and gas phases 8304

Polymers
rubber-like, ultrasonic wave propagn. 165
fibres and films, microwave dielectric meas. 285
temp.-dependence of diel. const. 298
dipole moments 299
crazing of linear high polymers 653
spectrophotometric mol. wt. det. in soln. 709
amorphous, swelling under strain 715
segment distribn. round c. of g. 721
polyethylene, proton magnetic resonance 1226
dielectric, rheological properties 1378
dielectric, apparatus for creep study 1379
nuclear magnetism, line widths 1459–60
cuprene, growth and properties 1461
electrolytic transference properties 1462
interferometric diffusion studies 1651–2
mol. wt. det. methods compared 1776
mol. wt. det., light-scattering photometer 1777
rubber cyclization, statistical kinetics 2116
light scattering in soln. 2587, 2590
light scattering, mol. wt. det. appl. 2588
optical anisotropy with orientated particles 2591
thermal conduct., rel. to stretch and temp. 2598
molec. shape, osmotic det. 2903
polymethacrylic esters solutions disintegration 3174
heterogeneous, precipitation threshold 3175
ultrasonic degradation 3178
solutions, viscosimeter 3359
rubber-like, dynamic shear properties 3819
high polymer soln., theory 4155, 5161
solutions, dumbbell model 4157
linear, near i.r. pleochroism 4287
therm. conduct., rel. to viscosity 4327
polystyrene solns., osmotic pressures 4871
high polymer solns., viscosity/mol. wt. rel. 4872–3
high polymer solns., viscosity conc. dependence 4874
ultrasonic depolymerization, cavitation 5190
ultrasonic waves effect 5193
solutions anisotropic, rodlike particles, scattering 5332
polar, elec. moments rel. to struct. 5642
high pressure compressibility 5844
chains volume effect, transition probability 5891
coiling polyelectrolytes, light-scattering 5892
relaxation of polyisobutylene and solutions 6055
in solution, second osmotic coeff. 6067–8
conc. solns., sedimentation equilib. 6070
plasticized, rel. of tensile strength to brittle temp. 6514
nuclear mag. resonance studies 6550
solutions, progress review 6655
molecule size det. from turbidities 6902
cryst. and amorphous states dualism 7300
solns., diffusion coeff. rel. to conc. 7602
ethylene, i.r. spectrum 7707
u.v. specific absorptions, protein struct. appl. 7718
striations produced by alternating potentials 7830
crystallinity calc. 8238
diffusion coeffs., discontinuous var. with conc. 8561
polydisperse, polar, dielect. loss 8723
constant-stress elasticity meas. 9026
polystyrene app. spec. vol. in soln. 9097
sarcosine, sedimentation, diffusion and viscosity studies 9098
diffusion const. meas. 9099

Polymorphism see also *Crystal structure*
chlorites, ordered structures 1485
RbBr 4891
Na and K niobates 5394, 9123
S, monoclinic-rhombic trans. 5905

Polynomials
least-squares coeffs. error, est. 2303
associated Legendre, approximations 2291
in log *x*, interpolation 3256

Polystyrene
conc. solution, viscosity, stress relaxation 6054
conc. solns., sedimentation equilib., osmotic pressure 6070
solutions, dielectric const. 6200
particles, use in electron microscopy 6501
tensile strength and brittle temp. 6514
apparent spec. vol. in soln. 9097
capacitors charge storage meas. 9437

Polythene see *Polyethylene*

Porcelain
breaking strength, rate-process theory appl. 683

Porosity see also *Permeability, mechanical*; *Surface measurement*
porous medium thermal convection, critical gradient 254
sand deposits 661
Kelvin's contributions 708
glass wool, etc., rel. to, permeability 3065
MoO_3/H_2 system 3802
porous metals, fluid flow 4144
metallic electrodeposits 5821
viscous and free molecular flow, theory 7604
gas flow through porous media 8569
elasticity of porous media 9743
gas adsorption on porous plugs 9790–1

Positive electrons see *Electrons*

Positive rays see *Chemical analysis, positive rays*; *Ion beams*
sources see *Ion sources*

Positrons see *Electrons*

Potassium
radioactivity geochronological appl., etc. 3226, 3960–1, 9190
evap. layers, photo-elect. emission 4389
eq. of state 8707

Potassium alum
dehydrated, water sorption 3871

Potassium bromide
luminescent decay 2557
thermal conductivity 2599
and KCl, mutual solid solubilities 3109
KCl–KBr mixed crystals, heat of formation 5633–7
elastic constants 9132

Potassium chlorate
crystals, colour props. 9409

Potassium chloride
density change with Ca^{++} addition 1473
thermal conductivity 2599
films, secondary electron emission 2750
and KBr, mutual solid solubilities 3109
crystals, degree of imperfection 3904
diffusion of solution 5159
films, slow electron interaction 5465
KCl–KBr mixed crystals, heat of formation 5633–7
soln., electrolysis, macroscopic space charge 5864
conductivity and transf. number in methanol. 7345–6
crystals, dielectric breakdown 8758
elastic constants 9132
soln., diel. props., u.h.f. 9444

Potassium dichromate
crystal rate growth det. 2158

Potassium iodide
F-centre photoelectric emission 318
with colour centres, new u.v. absorption bands 5272

Potassium niobate
ferroelectric properties 5394

Potassium nitrate
and $Sr(NO_3)_2$, crystallization, radio Sr invest. 3387
heat capac. and heat of fusion det. 4348
crystal, Sr traces spatial distrib. 8336

Potassium phosphate
KH_2PO_4, elec. saturation and pyroelectric effect 2674
elastic constants, ultrasonic method 3089

Potassium sulphate
diffusion of solution 5159

Potassium tantalate
ferromag. Curie point, v. low temp. 294, 1818

A complete list of the Subject Headings will be found at the end of the Index.

Powders see also *Granular structure*; *Particle size*; *Sintering*; *Surface measurement*
surface meas., air flow method 104
powder metallurgy, dilatometry appl. 1337
catalyst dispersion, X-ray scattering det. 1401
bulk density, meas. and control 1634
stress det. in powdered mass 1780
particle size and diffracted X-ray power 2169
electrification on dispersion 2656
powdered alloys, coercive force rel. to particle size 2841*
spheroidization of metallic particles 3058
electron microscope specimen prep. 3083
striations formation method 3202
resin-bonded, mech. properties 3828
surface area det., new method 4129
statics, under compression 4809
dielectric const., new deduction formula 5387–8
surface det., adsorption method 5881
microcryst., light absorption meas. 6878
annealing without sintering 7440
ferro-nickel coercive force 8839
electrification by spraying 9436
W metal, agglomeration 9737
gas adsorption 9790–1
chemical production of alloys 9888
Praseodymium
atomic heat 6395
Praseodymium oxide
magnetic susceptibilities 7099
Pressure see also *Atmospheric pressure*; *High-pressure effects*; *Vapour pressure*
definition in superflow 2626
smooth reactions of bodies in contact 4124
press.–compressibility 4573
effect on semiconductors resist. 6213
gas columns impact 6072
gas evolved in reaction, apparatus for meas. 9052
Pressure measurement see also *Manometers*; *Vacuum gauges*; *Vapour pressure measurement*
t $\sim$ 10,000 atm. 1386
an superflow 2626
detonation, new pressure-bar method 3126
rapidly changing press., pickup and oscillograph methods 4132
photographic recorder 7582
change of quartz piezo frequency 9454
gases, by far u.v. opt. absorpt. 9802
Prisms, optical
roof, diffraction pattern deterioration 1769
new const.-derivation arrangement 4226
reflections, index meas. aid 4230
transmittance 5234
spectrum line curvature, Study's coordinate appl. 6096
Probability see also *Errors*; *Random processes*; *Statistical analysis*
intermediate statistics 96
first-passage-time problem 788, 4120
quantum probabilities calculus foundation 833
telecommunication, availability calc., appl. 3264
least squares, nonindependence considerations 3309
telephone systems delay times calc. 4039
Laplace's law, generalizations 5978
message adaptation to transmission channel 8429
electron–photon cascade shower theory 9530
Projectiles see *Ballistics*
Projectors, optical
electrometer filament projector 2593
Promethium
spectral ident. as rare earth 5249
magic numbers explanation 6387
Prominences, solar see also *Astronomical spectra*
r.f. radiation 31
chromosphere thermodynamic structure 56–7
model chromosphere from radio data 34, 6698
and cosmic-ray origin 417
effect on cosmic-ray star production 459
cosmic-ray intensity variation 460
chromosphere heating, hydrodynamics 794
luminescence fluctuations 812
electron and proton concn. 813
geomagnetic effect 1582, 6612, 8369
Prominences, solar—*contd.*
new chromospheric telescope 2306
r.f. radiation spectral type 2328
r.f. radiation, outbursts 2329
eruptive, of Sept. 1948, motion 2335
"ionosphere solar index" 3234
phosphophotography in i.r. 3267
spectrophotometric classification 3285
ionospheric effects (1949) 3979
hydrodynamics 4067
effect on primary cosmic-ray intensity 4509
solar atmos. motion from r.f. meas. 5028
corpuscular streams expulsion 5030
observation of corpuscle streams 5031
polarization in H_α and D_3 5032
eclipse observations in 6562·8 Å rays 5033
assoc. radio noise bursts 6692
apparent effect of earth on activity 6693
intensity of u.v. radiation 7415
eruptive filaments 7468
eruptive, ascending motion 8454
cyclic behaviour 8455
ionization equilib., chromosphere 8456
chromospheric eruptions, spectrophotometry 8460
chromosphere u.v. emission 9239
chromosphere He excitation 9243
Propagation see *Acoustic wave propagation*; *Electromagnetic wave propagation*
Propane
flames, quenching distance 2618
C^{13}-substituted, mass spectra 4484
Prospecting see *Geophysical prospecting*
Proton spectra
long-range, from d on C^{12} 1303
d on enriched Si, rel. to atomic masses 2040
from Ag and Al photodisintegration 2047
ejected by 90 MeV neutrons 2050
$Mn^{55}(d, p)Mn^{56}$ and $V^{51}(d, p)V^{52}$ 3007
$N^{14}(n, p)C^{14}$ 1309
from $N^{14}(d, p)N^{15}$ and $N^{15}(d, p)N^{16}$ 3010
groups from d on F^{19} and P^{31} 3014
emission from compd. nucleus F^{18} 4697
$B^{10}(d, p)B^{11*}$, B^{11} energy levels det. 4718
Cu photodisintegration 4721
high energy photoprotons 4722, 7268
from direct photodisint. processes 5776
from $Mg(\gamma, p)$ 5777
from γ on C, photoplate analysis 8976
from high-energy γ-rays 9706
Protons see also *Cosmic rays, protons*; *Nuclear reactions, protons*
high-energy elastic scattering of electrons 373
energy meas. with scintillation counters 391
γ-ray coincidences in (d, p) reactions 613
in solar chromosphere and prominences, concn. 813
magnetic analyser 1115
density variation in nuclei 1236
electrostatic repulsion in nucleus 1239
r.f. emission in high fields, cosmic radiation hypothesis 1577
Birmingham proton synchrotron 1871
from Ag and Al photo-disintegration, to neutrons, ratio 2047
H^+-ion in aq. solns., proton theory 2130
entry into atmosphere during aurora 2231, 4002
structure, gamma-ray scattering invest. 2988
high-energy collisions 3336
chemical binding, slow neutron invest. 3693
Møller scattering of μ-mesons 3789
cause of aurora 4000
in aurora, energy rel. to aurora magnitude 4001
no. in universe, original calc. 4109
conductivity through solid alcohols 4375
canal-ray polarization, values calc. 4457
ionization yields 4485
H absorbed in Ta, internal motion 4570
elementary particle theory 5106
e/M meas. by cyclotron resonance 5381
mass, rel. to electron mass 5382
cyclotron r.f. acceleration system 5476
$< 3{\cdot}7$ MeV, scint. counter response 5498
detection techniques, survey 5684
p–p collisions, π^+-meson production 5745

A complete list of the Subject Headings will be found at the end of the Index.

Protons—*contd.*
  potential between 2 protons, det. 6038
  auroral spectra H-line broadening 6654
  polarizability 6736
  multipole oscillations in nucleus 7177
  π meson production in C and H 7292–3
  emission from sun 8452
  neutron-proton collision e.m. radiation 8527
  fast, exchange collisions with deuterons 8968
  electron capture cross-sections in H 9564
  emission from C at 90° to proton beam 9690
  density of phototracks 9720
 absorption
  range-energy, rel. to emulsion composition 3581
  340-MeV, energy for ion-pair production 4456
  range-energy calc. up to high energies, in emulsion 5482
  heavy ice, review 5483
  range data for photo emulsions 6270, 8790
  slow, range in emulsion 7027
  35 to 120-MeV, range and straggling 7955
  18 MeV, abs. energy loss 7956
  emulsions range-energy comparison 9538
  capture processes in light elements 9688
 angular distribution
  Al^{27}(*d*, *p*)Al^{28} 610
  O^{16}(*d*, *p*)O^{17} 610, 3017
  Li^{6}(*d*, *p*)Li^{7}, angular yield 2036, 7261
  from deuteron photo-disintegration 2046, 5763
  Ag and Al photodisintegration 2047
  ejected by 90 MeV neutrons 2050
  F(α, *p*)Ne 2992
  from 10·3 MeV d on D 8189, 8972
  C^{12}(*d*, *p*)C^{13} 8191
  (*d*, *p*) reactions study 3766
  14-MeV (*d*, *p*) reactions 4712
  d bombardment of Be 5757
  320 MeV photoprotons 7268
  from *d* on Li^{6}, ang. correl. with γ 9699
  low-energy deuteron photodisintegration 9704
  from high energy gamma-rays 9706
  from nuclear photoeffect 9709
 magnetic moment
  direct determination 1982, 5662
  proton and neutron 2379
  diamag. corrections in water and oil 3702
  mag. shielding, H_2, H_2O, oil 4605
  D^{2} and H^{1} invest. 7182
  effect in hyperfine structure calculation 7679
  meas. by precession/cyclotron freq. ratio 8901
 negative
  and nucleon-meson interactions 840
 production
  by *d* on C^{14} 2041
  C^{12}(γ, *p*)B^{11} excitation function 3018
  photoproton yield, 20 elements 5778
  by high-energy γ-rays 7268
  He^{4} photodisintegration yield 9707
 scattering
  by C 1118
  nuclear field invest. 1241
  neutron production below (*p*, *n*) threshold 2038
  by H_2 2758
  high-energy cyclotron beam, multiple traversals 4453
  inelastic, Li^{7} and Be^{7} excited states study 4710
  by tritons 5481
  elastic, from C, N^{13} excited states invest. 5748
  elastic, survey expts. 6267
  ½–2 MeV, Be, Cu, Au, compound 7952
  internal cyclotron beam 8187
  high-energy, multiple, Coulomb 8785
  340-MeV, elastic, C, Cu, Pb 8963
  from Al, elastic and inelastic 8964
  elastic, by O 9693
  by O, F^{17} energy levels angular moments assignment 9694
   proton-deuteron
  at 5·0 MeV 2759
  deuteron scattering lengths 3001
  elastic 190 MeV 7025
  compound, ang. distrib. 7952
  10·4 MeV *d* by H 8188
   proton-neutron see *Neutrons, scattering*

Protons—*contd.*
 scattering—*contd.*
   proton-proton
  12·4 MeV at 90° 382
  spin-orbit interactions 852
  P–P interaction det. 856. 5100
  18·8 to 31·8 MeV, energy dependence 1875, 5480
  at 100 MeV 1876
  qualitative explanation 3331
  120–345 MeV expts. 4450, 8786
  at 3·4, 6·8 and 7·5 MeV 4452
  nucleon hard-sphere model 4454
  5-MeV, cross-sections 4455
  review of experiments and theory 4687
  high-energy, review 4699
  π-meson production 4748*
  105 and 75 MeV 7026
  2-nucleon systems, scattering phase shifts 8234
  146 MeV 9537
Pumps see also *Vacuum pumps*
  electromag. Hg pump 8321
Pyrometers
  optical, nomograms 1022
  optical, progress survey 2636
  optical, measurements scatter 4347
  radiation, i.r., 2-colour 5366
  photoelectric, pseudomonochromatic systems 5367
Quantum theory see also *Electron theory*; *Field theory, quantization*; *Fundamental particles*; *Statistical mechanics*
  characterization of operators 3
  elementary particles, de Broglie 90
  positron and electron scattering comparison 374
  A atoms, interatomic potential function 556
  separated systems paradox 832
  probabilities calculus foundation 833
  the uncertainty relation 858
  transformation into momentum space 1597
  origin and development, reviews 1598, 4077–8, 4081
  relativistic, for finite time intervals 2364
  hermiticity of $(h/2\pi i)\partial^{k}$ 2388
  $i\hbar\partial/\partial t$ spectrum characteristics 2389
  uncertainty relation, general formulation 2395
  perturbation calculations 3319
  relativistic quantum mechanics 3320
  discrete space-time and Lorentz transformations 4073
  conceptual foundations, review 4080
  general textbook 5069
  time reversal and Dirac eq. 5110
  virial theorem in 5129
  change of state caused by measurement 6020
  action as space coordinate 6724
  quantum statistics of fields 6732, 9266
  statistics, distributions, lattice valuation appl. 6757
  radiowave emission 7111
  virtual states perturbation 7554
  perturbation theory 7555, 9282
  4th uncertainty relation 7557
  eq. of motion and commutation relations 8497
  passage of particles through potl. barrier 8528
  tensors appl. 9286
 applications
  benzoin rotatory power 240
  $X_2Y_2X_2$ molecular model energies calc. 528
  H molecule polarizability 529
  He atom repulsive potential 557
  symmetric configuration energy 717
  identical molecules resonance 720, 3169
  electrostatic image force theory, quantum limits 1031
  H_2 molecule, new calc. 1214
  in astrophysics 1568
  communication theory 1594
  low temp. research, review 1599
  atomic radiation between reflecting planes 1607
  quantum-mechanical equation of state 1629
  superconductivity theory 1847–8, 4397
  Li wave-function, ground state 1985
  ditto, ionized 8903
  turbulence 2453, 6076*, 8548
  microwave collision broadening 2535
  molecular collisions theory 2891
  Mg I atom, wave functions and transition probabilities 2928

Quantum theory—*contd.*
  applications—*contd.*
    K radiative absorption cross-section 2931
    ferromagnetism, classical spin-wave theory 3622
    paramag. absorption nuclear effects 3635
    in chemistry, review 4079, 5845
    history, review 4081
    Lamb shift for spinless electrons 4099
    quantum effects in optics 4217
    spin waves in ferromag. theory 4525
    LCAO calc. CO_2 ground state 4587
    twisting freq. and π-electron levels, allene 4588
    solids, densities at extreme compression 4810
    C–H bond polarity, field calc. 4866
    paramag. salts resonance absorpt. explanation 5573
    linear molecular chains model 5638
    photographic density rel. to exposure 5964–5
    liquids, eq. of state 6188
    electron emission theory 6263
    magnetic anisotropy 6318
    ionic currents 6657
    electron theory 6734
    scattering problems, asymptotic phases 6743
    2nd law of thermodynamics 6755
    assemblies of interacting particles 6758
    ferromagnetism 7063
    molecules, integrals calc. 7148
    Schrödinger integrals, many-electron atoms 7196
    ditto, antisymmetric vector-coupled functions 7197
    visual thresholds 7429
    variational method, nature of scale factor 7509
    Coulombic potentials, bipolar expansion 7530
    Stark levels, non-adiabatic transitions, H 8147
    information theory, statist. anal. 8429
    diamag. anisotropy org. molecules, calc. 8875
    chem. kinetics, intramolec. rearrangements 9762
    quantum hydrodynamics 9297
    ditto, liquid He 6178
    free electron ferromag. theory 9590
  radiation see *Electrons, radiation*; *Field theory, interactions*; *Radiation, theory*
  ***S*-matrix theory**
    stationary states 65
    n–p scattering, differential phase equation 86
    in Heisenberg representation 94
    theory of elementary particles 835
    collision matrix evaluation 853
    e.m. fields non-linear interactions 1609
    spinless mesons and nucleons in e.m. field 1613–14
    variational methods in collision problems 1616
    Dyson and Feynman's $S(\sigma)$-operator 1620
    time-dependent problems variational principle 1623
    irreducible fields and their interaction 2367
    non-local field theory 2385, 9265
    in meson theory 3337
    neutron scattering by deuterons 3798
    S-matrix eval. 4103, 8523
    overlapping divergences 4104
    Dirac eq., singular solutions, with externa mag. field 4112
    a Lorentz-invariant integration 5079
    in Yukawa's non-local field 5098
    relativistic theory of quanta, arbitrary constants elimination 6728
    non-local electrodynamics 6733
    connection with causality 6749
    eigenvalue problem in field theory 6752
    S-matrix and radiation damping 7528
    analytic continuation 7540
    elementary particles, causality problem 7549
    adiabatic theorem and *S*-matrix 8526
    operators interpretation in positron theory 8532
    non-stationary processes, damping 9272
  spinor equations
    spinor fields interaction, new mode 84
    spinor fields, quantization 843
    photon tensor equations, spin 1 particle complexity 845
    gauge-spin transformations and wave eq. 5107
    nonlinear spinor fields 6742
  wave mechanics
    virial theorem and variation principle 91, 2394
    wave function in perturbation theory 92

Quantum theory—*contd.*
  wave mechanics—*contd.*
    periodic potential eigenfunction problems 93
    interpretation of Kohlrausch's atomic constants system 558
    fundamental modes, numerical det. 780
    classical eigenvalue problems, Laplace transform soln. 781
    Laplace transform. calc. of H atom matrix elements 857
    radiationless transitions, perturbation theory 1252
    irreducible space-time volume theory 1595
    eigenvalues for closed systems energy 1621
    spin $> \frac{1}{2}$ particles, spectral decomp. 1624
    wave eqs. in momentum space 1625
    superconducting electrons, wave functions 1846
    atoms excitation, Born and Oppenheimer approximations 1890
    ang. correl. phenomena, theory 1989, 4114
    Dirac eq. photons appl. in nebulae recession correction 2343
    non-superquantized formalism, relativistic symmetry 2368
    Dc-function in wave-fields theory 2373
    Dirac's eq. Fourier transformation 2380
    adiabatic theorem 2386
    emission principle 2390
    radial wave functions and Coulomb functions 2391
    irreg. Coulomb fn., asymptotic expansion 2392
    singular potentials 2393
    τ-meson, nature 3045
    Klein–Gordon equation in mag. field 3340
    invariant from 4 Dirac wave functions 3341
    non-holonomic systems 3342
    relativistic scattering theory, wave-statistical treatment 3343
    rotational mag. moment, polyatomic molecules 3686
    space and time quantification 4106
    quantification of mass and vel. 4107
    variables discontinuity theory, cosmolog. consequences 4108
    ditto, electrons and protons no. calc. 4109
    spin models possibility 4110
    material waves, review 4111
    Hartree–Fock method simplification 4113
    quadratic first integral existence 4115
    $(-h/2\pi i)\partial_k$ dist. function var. 4116
    diverging potentials and virial theorem 4117, 6042
    one-dimensional reflections 4118
    elec. and mag. fields effect on polarized electron beams 4669
    antisymmetric function integrals 4996
    Yukawa nuclear forces theory 5068
    generalized transformation function 5083
    Dirac central field wave functions 5111
    spin 0 or $\hbar$ particles, wave eq. 5128
    Dirac particle in central field 5130
    Coulomb wave functions calc. 5131
    general theory of scattering 6027
    variational deriv. arbitrary-spin, multiple-mass particle eq. 6030–2
    factorization ladders and eigenfunctions 6037
    transition probabilities calc. 6039
    energy conservation conditions 6040
    rel. to classical mech. 6041
    wave function amplitude change rate max. 6043
    vector particle, Coulomb field, energy levels 6044
    alpha-disintegration wave-statistical theory 6422
    perturbation theory theorems 6673
    Schrödinger eq. soln. for approx. atomic field 6753
    tensor identities in wave-tensor calculus 6754
    atomic collisions theory 7551
    Klein–Gordon eq., statist. interpretation 7552
    de Broglie wave-eq. and relativity principle 7553
    Coulomb scatt. wave functions, momentum 7559
    curvilinear momenta 7564
    particle scattering in potl.-well 7565
    molecular H, wave function 8100
    atomic physics textbook 8111
    relativistic, and mass operator 8496
    3 Dirac matrices, rel. 8518
    generalized wave-eq., theory 8529
    classical field mech. study 8530

Quantum theory—*contd.*
  wave mechanics—*contd.*
    non-localizable fields 8531
    numerical variational method 8534
    Schrödinger eq. for Coulomb potential, soln. 8535
    approx. wave-functions satisfying virial theorem 8873
    calc. of eigenvalues 9284
Quartz
    Straubel *X*-cut crystal, sound field 155
    thermal scattering 238
    piezo-electric appl. 302
    piezo-electric coeff. temp. dependence 1046
    faces, development and surface energy 1513
    thermal conduct., low temp., neutron irrad. effect 1793
    alpha- and beta-, piezoelectric constants 1823
    crystal blanks, aging 1824
    vibrators, theory, applications, manufacture (book) 2459
    absorption, electric and thermic treatment effect 2525
    light scattering, Brillouin components 2583
    piezoelectric crystals, commercial prep. 2675
    oscillator plates mfr. 2676
    lamina, elastic modulus rel. to thickness 3087
    lattice parameter, precision meas. 3205
    vibrating plates, interference obs. 3407
    inversion at high pressure 3491
    cathode luminescence 4289
    optical rotation, i.r. to $9 \cdot 7\ \mu$ 4314
    bent-crystal technique 4419
    elastic and piezoelectric coeffs. det. 5174
    in i.r. reflection spectroscopy 5270
    crystal-growing expts. 5903
    absolute adsorption isothermals on 6546
    colour centres by X-rays 6558
    $\alpha \rightleftharpoons \beta$ transformations, adsorption effect 6925
    zero temp.-coeff. crystals 7371
    large crystals growth 7375
    thermal conductivity, low temp. 7802–3
    piezo-elec. const. meas., new method 7843
    "piezocrescence" invest. 8335
    breaking stress as piezoelectric transducer 9353
    change of piezofrequency with pressure 9454
    piezoelectric cryst., elec. const. det. 9455
    growth in alkali halide solutions 9809
    low temp. coeff. crystals production, X-rays appl. 9819
Radiation see also *Acoustic radiators*; *Electromagnetic waves*; *Electrons, radiation*; *Emissivity*; *Stars*; *Stellar structure*; *Sun, radiation*; *Sunlight*
    2 537 radiation production in A–Hg discharge 1079
    Ni and oxide cathodes, spectral emittance 2492
    Cherenkov, from mesons 3047
    in extended stellar atmospheres 3298
    flames, review article 3492
    ang. distrib. at media interface 3799
    stellar atmos., anisotropy 4062
    Planck's formula, 2nd const. 5226
    proposed wave-number unit 6014
    complete energy spectrum 6093
    spectral distrib. meas., low intensity 7656
    from diffusion flames, study 8691
    modif. to Stefan Boltzmann law in non-linear electrodyn. 9356
    from synchrotron beam, spectral dist. 9539
    in atmosphere, review 9847
  heat
    meas., photocell compensator 2490
    radiation convection and cooling law 2604
    radiative temp. changes calc. 4328
    from heated cylinder 6165
    radiation clouds formation, atmos. 6620
    black-body temp., abs. method 7650
  theory see also *Field theory, interactions*
    nucleon-nucleon collision Bremsstrahlung 76
    Wien's law, and appl. 924
    Klein–Nishina formula approximations 1298
    atomic radiation between reflecting planes 1607
    configurations transformation, multipoles appl. 3323
    Maxwell's demon, information and entropy 3500
    octupole transitions, matrices 4678
    polarized radiation, Laplacian random functions 4995
Radiation—*contd.*
  theory—*contd.*
    quantum mech. textbook 5069
    line co-ordinates study 5224
    Cherenkov, conic dist., natural spread 5468–9
    radiation and gravitational eq. of motion 6722
    action as space coordinate 6724
    quantum statistics of fields 6732, 9266
    blackbody radiation by solids and gases 7652
    Planck's formula 7653
    large wavelength radn. in ionized medium 8059
    energy density in dispersive medium 8070
    light scatt. by bound electron 8148
    interaction with ionic crystal 8346
    e.m. radiation during neutron-proton collision 8527
Radiation chemistry see *Chemical effects of radiations*; *Radiochemistry*
Radiation detectors see also *Bolometers*; *Photometry*; *Radioactivity measurement*; *Thermopiles*
    rectified r.f. appl. 1464
    thermoelements and high-sensitivity photocell compensation 2489
    non-contacting thermometer 2637
    very sensitive radiometer 4220
    photocell for visible and u.v. spectroscopy 6838
    $C^{13}O_2$ chopped i.r. cell 7754
    phosphor excited by far u.v. 8649
    improved Bellani pyranometers 9193
    infrared, atmosphere 9194
    thermal, effect of alternating light 9354
    wall temp. meas. 9433
Radiation monitoring
    X-ray film badge dosimeter 361
    ionizing particles, dosimetry 771
    ion chamber equipment 1123
    counters and counting systems 1124
    ionization meas. in mines 2230
    simple Ra detector 2264
    high-energy, dosage units 2725
    X- and γ-rays, photographic 2726
    units, instruments, internat. recomm. 3554, 4013, 9877
    hands and feet, monitoring installation 3717
    liquid-waste, evap. method 4012
    radiation dosimetry, chemical method 4631
    survey of techniques 5684
    X- and gamma-rays, photographic films appl. 5957
    radioactivity in human breath 6665
    chemical dosimetry 7200
    phosphorus-Bakelite β-ray sources 7225
    direct reading meter, γ-emitting samples 8155
    scintillation X-ray counter 8799
    in vivo detector, scintillation 8800
    radiation from human body 9654
    combined dose/dose-rate meter 9882
Radiation pressure
    acoustic, theory 164, 5210
    particles in vacuum 170–1
    magneto- and electro-photophoresis, theory 524
    cosmic rays origin theory 1900
    interstellar matter energy loss as cause of red-shifts 2320
    in planetary nebula 4057
    h.f. sound, absolute meas. 4212
    corpuscular stream expulsion from sun 5030
    influence in restricted 3-bodies problem 5979
    solar, effect on atoms of gases 5991
    in refracting medium 6092
    acoustic waves, calc. 7644
Radiation protection see also *Radiation monitoring*
    X-radiation from electron microscopes 1089
    radon collection and purification, remote control 1260
    M.I.T. cyclotron concrete wall 1334
    humans and animals, review 1986
    surface decontamination 2149*
    occupational hazards 2262
    in photograph X- and γ-ray meas. 2726
    international recommendations 4013, 5958, 9877
    atomic energy hazards 4974
    radioactive isotopes, max. permissible amounts 5959, 8399
    in gamma radiography, review 5968
    drugs, effectiveness 6664

A complete list of the Subject Headings will be found at the end of the Index.

Radiation protection—*contd.*
  recovery from radiation injury 7433
  equipment for remote handling 7434
  γ-ray source shield 8307
  Co^{60} shielding calc. nomogram 8397
  survey (1949) 8398
  dust separation equip. 8400–1
  radioactive water decontamination 8402
  cyclotron workers, eosinophile count changes 8403
  in nucl. physics medical appl. 8405
  radioactive dust separation 9876
Radioactive disintegration theory see also *Nucleus, theory*
  electron and excited nucleus, beta decay 591
  Fermi β-distribution function 592, 4090, 4665
  natural alpha-radioactivity theory 1279
  ang. correlation of successive radiations 1988–9, 3719, 4114
  alpha-radioactivity data, review 2007
  allowed β-spectrum, review 2014
  $\alpha\gamma$ ang. correl., in cascade 2692–3
  β-disintegration, abnormal radiation 2969
  $0 \rightarrow 0$ transition in O^{16} 2975
  comparative half-lives interpretation 2977
  dipolar transitions, anomalous decay time 3682
  γ–γ-ang. correl., 2^{L-1}-magnetic, 2^{L}-electric interference terms 3747
  radiative transitions, theory 4095, 9674
  Te isomers, cross-over transitions absence 4637
  beta-decay, first forbidden shape factor and *fnt* products 4666
  beta-decay and meson-decay 4670
  nucleon beta-disinteg., radiative corrections 5095
  delayed coincidence ang. correl. 5702
  α-emission systematics 5710, 8890
  alpha-radioactivity, non-central electric interaction 5711
  twice forbidden Cs^{137} transition 5716
  polarization of βs from aligned nuclei 5720
  higher order effects in β-decay 5721
  β-decay interaction 5722
  electron-neutrino ang. correl. 5723
  β-decay *ft*-values and shell models 6389
  alpha-disintegration, tables and graphs 6421
  alpha-disintegration, wave-statistical theory 6422
  β emission internal recombination effect 6427
  $\beta\gamma$, successive, angular correl. 7228
  forbidden β-ray spectra 7233, 8173
  β-decay, new formulation 7234
  Fermi theory, symmetry principle 7235
  effect of finite nuclear size 7236
  β-emitters, continuous γ-radiation 7245
  internal conversion theory 7250
  radius of decaying nucleus 8118
  ang. correl. in triple cascade transitions 8156
  double β-decay theory 8171, 9666, 9669
  β-decay interaction constants for mixed invariants 8172
  correlation phenomena and polarized neutrons capture 8209
  classification of nuclear isomers 8894
  effect of external particles and fields 8912
  scattering, effect on ang. correl. meas. 8913
  modification of time constants by ext. influences? 8915
  neutrino spin 8938
  isomeric transitions 9658
Radioactive tracers see also *Chemical analysis, radioactive*
  lubrication invest. 866
  Co^{60}, self-diffusion invest. 1341, 4774
  catalytic research appl. 1405
  surface adsorption from mixtures 1453
  oxide cathodes study 1894
  I^{131} clinical diagnosis 2265
  thermal diffusion investigation 2436
  Na^{+} auto-diffusion coeff. det. 3062
  radio-S invest. of S-exchange reaction 3112
  amalgam. electrodes exchange currents meas. 3141
  convective flow detection 3367
  KNO$_3$ and Sr(NO$_3$)$_2$ crystallization 3387
  metallurgical applications 3755
  surface damage investigation 3845
  lubricant film adsorption study 3850
Radioactive tracers—*contd.*
  chem. analysis, review 3891, 8325
  chromatogram analysis 3898
  leak location, buried pipes 4628
  diffusion invest. in crystalline silicates 4775
  snow gauge, telemetering 4915
  closed steady-state systems, math. interpret. 4958
  thin film thickness meas. 5140
  C^{14} chemisorption, surface heterogeneity criterion 5850
  CO$_2$–C reaction study with C^{14} 5854
  gegenion adsorption study 5883
  in vivo measurements 5946
  maximum permissible amounts 5959, 8399
  tolerance of man 6655
  diffusion in solid S 7305
  electromigration study in cation exchange resin 7347
  adsorbed layers invest. 7354
  equipment for remote handling 7434
  segregation in Pb–Bi alloys 8240
  in solid solution investigation 8243
  scintillation *in vivo* detector 8800
  precipitation and separation methods 8954–5
  exchange between ions in soln. and metal 9041
  anomalous co-crystallization with NaCl 9126–7
  brain tumour localization 7437, 9551
  isotope separation 9646
  specific activity and turnover rates det., errors 9652
  P^{32} solution, particulate impurity 9653
  high-res. radioautography 9897
Radioactivity see also α-, β-, γ-*rays*; *Chemical analysis, radioactive*; *Chemical effects of radiations*; *Geophysical prospecting, radioactive*; *Nuclear excitation*; *Nuclear reactions*; *Radiochemistry*
  charged UX$_1$ atoms from U^{238} α-disint. 626
  energy differences of series 1277
  successive radiations, directional correl. 1989, 2940
  alpha-emitters, rel. to heavy nuclei stability 2007
  rare-earth region α-active isotopes mass assign. 2008
  heat production in Earth's crust 2192
  C^{14} archaeological dating 2193–4, 5685, 6619
  of atmospheric precipitation 2216
  natural radiocarbon, world dist. 2935
  natural α-emitting elements, linear property 2964
  β-ray spectra shapes 2976
  cosmic-ray stars, β-decay emission 3620
  irradiated crystals, invest. 4288
  isotope specific activity calculator 4629
  β-active radio-element, new high ($H\rho$) particles 4658–9
  β-transitions, log *ft* calc. 4664
  beta-decay *fnt* products 4666
  – ve β-decay, orbital, perturbation effects 5674
  radioactive matls., vacuum evap. separation 6922
  radioactive snows invest., Las Vegas test 7203
  ft values in beta-decay table 7209
  phosphorus-Bakelite β-ray sources 7225
  influence on cathode emission 7986
  mineral sorting by neutron-induced activity 8153
  ang. correl. in triple cascade transitions 8156
  radioactive dust separation 8400–1
  radioactive nuclei from cosmic ray stars 8829
  ang. correl. between proton and γ-ray from excited intermed. state 8899
  new types, qualitative discussion 8910
  source of error in geol. age det. by U^{235}/U^{238} ratio 9188
  natural, geophysical consequences 9189
  atmosphere, new studies 9221
  of natural water 9647
  Szilard–Chalmers process, review 9778
  AcA and RaAc 1265
  Ag$^{105,\,106}$ gamma-rays 1288
  Am isotopes 565
  Ba^{131}, coincidence studies 5727
  Ba^{131}, γ-radiation 2987
  Be^{8}, from Th^{232} fast *n* ternary fission 9711
  Bi, natural alpha-activity 8158
  Ce 5726
  Co^{60}, soft beta-component 1281
  Co^{60} γ-radiation 6433
  Cr^{55} 6414
  Eu, *n*-deficient isotopes 9657

- **Radioactivity**—*contd.*
  - Gd, *n*-deficient isotopes 9657
  - $Hg^{203, 205}$ 5694
  - In, natural 2945, 6416
  - Ir, new isotopes 566
  - K beta-activity 3737
  - K, age of earth 3961
  - K heat production 5687
  - K^{40} positron activity 6410–1
  - K^{40}, age of atmos. 5936
  - K, and related geophys. problems 9190
  - Kr^{89} recoil nucleus energy 7237
  - Kr of radioactive origin, search 6399
  - La neutron-deficient isotopes 5704
  - Li^{8}, beta-alpha-correlation 5703
  - Li,^{9} delayed neutron activity 9732
  - Mg^{24}, high-energy γ-ray 7244
  - O^{16} internal pair creation 5718
  - RaE* → RaE abnormal slowness 6388
  - Ra and deep-sea chronology 7402
  - RaD cryst. diff. spectrography 3744
  - RaD → RaE *L*-spectrum 3745
  - RaE radiation accel. by uniform mag. field? 3675
  - Sm^{147} mass assignment 1994
  - $Sn^{117, 119}$ isomers 595
  - Sr from *d* on Rb 5697
  - T beta spectrum 8165
  - $Tl^{199, 200}$ 9656
  - U, natural, 235/234 ratio meas. 8161
  - U and Th, evolution in Earth 9182
  - **artificial production** see also *Nuclear reactions*
    - Am isotopes 565
    - O^{183} and Os^{182} from Re proton bombardment 1275
    - Eu from Sm 2001
    - Cl^{38} from LiCl 2016
    - Os^{185}, Re^{183-4} from W 2032
    - Cm^{243-4} 2933
    - light rare-earth isotopes, by (*p*, *xn*) reactions 2948
    - Be^{7} from Li 2996
    - $Sc^{44, 46, 47, 48}$ from Ti 2997
    - Co^{58m} from (γ, *n*) 3023
    - separation of active Sb 3757
    - Cf isotopes from C-ion U bombardment 3762
    - Th^{235} and Pa^{235} 4641
    - carrier-free Mn^{52} prep. 4690
    - $Bi^{204, 206}$ prep. from Pb 4700
    - Mn^{52} from Cr 4701
    - in explosion of shaped charges, lined cavity 5735
    - Pd^{103} from Rh 5751
    - Z^{65} by *d*-bombardment of Cu 6443
    - separation by differential vac. evaporation 6922
    - fission products, indust. utilization 8216
    - medical appl. 8405
    - P^{33} 8914
    - Fe^{59} from Co 8966
    - Cr^{51} from V 8967
  - **decay periods**
    - short metastable states det. 394
    - nuclei life times and natural elements stability 2937
    - complete reference tables 2938, 6402
    - elements 97 and 98, isotopes 2951
    - element 61^{145} 2952
    - Fermi beta-decay theory, comp. half-lives 2977
    - v. short, measurement 6406
    - neutron half-life 7205, 9009
    - β-decay periods, table 7209
    - coincidence meas., errors 8159
    - modification by external influences? 8915
    - isomeric states half-life values, study 9658
    - most probable value det. 9659–60
    - $A^{38, 739}$ 1996, 2957, 3012
    - Ac^{227} 2954
    - $Ag^{105, 107, 109-10}$ 1995, 5779
    - Am isotopes 565
    - $As^{77,79}$ 4648
    - At isotopes 4655
    - $Au^{198, 200, 201, 203}$ 3727, 4640, 5693
    - B^{8}, B^{12} 2003, 8917
    - Be^{7}, effect of chem. binding (erratum) 4634–5
    - $Br^{80, 82, 83, 84}$ 2955, 2958, 3731, 4640, 5695
    - Bi^{207}, 50-yr. 5688
    - Bk^{243} 2949
    - $C^{14, 15}$ 2041, 5692

- **Radioactivity**—*contd.*
  - **decay periods**—*contd.*
    - Ca^{42*} 2957
    - Ca^{41}, by *e*-capture 7215
    - $Cd^{105, 109, 113}$ 1995, 2968
    - Ce^{133-4} 2948
    - $Cf^{244, 246}$ 2950, 3762
    - Cl^{38} 2955
    - Cm^{243} 2949
    - Cm^{242}, spont. fission 4646
    - Co^{58m}, Co^{60} 3023, 3725, 4640
    - $Cu^{64, 66}$ 2953, 3727
    - Dy^{159}, long-lived 5691
    - Em^{216} calc. 5710
    - $Er^{163, 166}$ 2956, 5693
    - $Eu^{150, 159}$ 5693
    - Eu, *n*-deficient isotopes 9657
    - F^{17} 2947
    - $Fe^{55, 56*}$ 2957, 3725
    - isotopes Gd 5693, 5695, 9657
    - Hf *n*-deficient isotopes 4650
    - $Hg^{198*, 199*, 203, 205}$ 1267, 2957, 5694–5, 8157
    - $Ho^{160-5, 167, 169}$ 568, 5693, 5695
    - I^{131}, and NaI^{131} anomalous decay 575
    - $I^{122, 131}$ 4638, 4640, 9655
    - I^{129}, earth's age 5696
    - In^{115-16} 2945, 3727
    - In, natural 6416
    - $Ir^{192, 195, 197}$ 4640, 5693
    - $K^{40, 42}$ 3726, 4640, 6623, 9667
    - Kr^{89-91} 5700* 5717, 7206, 7237
    - La^{134} 2948
    - Lu isotopes 4650, 5693
    - Mg^{24*} 2957
    - Mo^{96} 0·8-MeV excited level, lower limit 8916
    - $Na^{20, 24}$ 2003, 2955, 4636, 4640
    - $Nd^{138-9, 142*}$ 2948, 2957
    - $Ni^{59, 63, 65}$ 1273, 3727, 4645
    - $Os^{182-3, 186, 188}$ 1275, 5695, 6403
    - P^{32-3} 4640, 8914
    - Pa^{235} 4641
    - Pm^{145} 4654*
    - Po isotopes from Bi and Pb high-energy spallation 4649
    - Po^{200-1} 7224
    - $Pr^{138-9, 142}$ 2943, 2948
    - Pt^{192} metastable 5695
    - Pu^{241-2} 3721
    - Ra^{220} calc. 5710
    - RaC′ 574, 1266
    - $Rb^{88, 90-1}$, etc. 2942, 2974, 5700*, 7206
    - $Re^{183-4, 188-9, 191}$ 4657, 5693, 5699
    - Rh^{105} 3731
    - Ru^{105} 3731
    - Se 576–7
    - $Sm^{143, 145-6}$ 4654*, 5693
    - Sr from *d* on Rb 5697
    - Sr^{87m} 2960
    - T 2946, 8160
    - $Ta^{182, 183-5}$ 4640, 5693
    - $Tb^{153-7, 162-3}$ 568, 5693
    - $Tc^{95-6, 99}$ 2955, 3720, 4639
    - Te isomers 2957, 4637
    - $Th^{224, 235}$ 4641, 5710
    - $Tm^{172-3, 175}$ 5693
    - U^{235} 7207, 8161
    - U^{235} fission products 8917
    - UY 5706
    - $W^{182, 188}$ 5695, 5699
    - $Xe^{129, 131}$ 5695, 6405
    - $Y^{87, 89}$ 2960, 8920
    - Y^{169} and Yb^{169m} 5689
    - Zr^{89} 8920, 8924
    - Zr, neutron-def. isotopes 7214
  - **decay schemes**
    - magnetic focusing coincidence spectrometer 367
    - coincidence absorption methods 579
    - beta-gamma angular correlation 589
    - ang. correl., D.R. Hamilton's method, general proof 1988
    - light nuclei β-decay constants 2911
    - complete reference tables 2938
    - elements 97 and 98, isotopes 2951

Radioactivity—*contd.*
- **decay schemes**—*contd.*
  - transuranium elements *L* X-ray specta 3750
  - artificial chains collateral to heavy families 4653
  - β-transitions, log *ft* calc. 4664
  - beta-decay and meson-decay 4670
  - alpha-disintegration, tables and graphs 6421
  - electron-gamma ang. correl. meas. 8937
  - A^{39} beta-spectrum 586
  - AcA 1265
  - Ag$^{106, 110-1}$ 585, 1268, 2017, 3729, 4652, 6418, 6432, 8163, 8922
  - Am^{242} 1992
  - As$^{74, 77}$ 4648, 5701
  - At isotopes 2983, 4655
  - Au$^{198-9}$ 7211, 8928
  - B$^{8, 11-12}$ 2003, 6415, 8927, 9662,
  - Ba^{131} $\rightarrow$ Cs^{131} $\rightarrow$ Xe^{131} 594, 7220
  - Ba^{140} $\rightarrow$ La^{140} 8926
  - Be^{7}, nuclear recoils 4644
  - Bk^{243} 2949
  - Br^{80}, β^+/β^- ratio 3739, 6423
  - Br$^{83-4}$ 3731
  - Ca^{41} 7215
  - Cd$^{109, 111, 113, 115}$ 573, 585, 1993, 2968, 3729, 4652, 4684, 6408, 8163
  - Ce$^{133-4, 141, 143-4}$ 571, 2948, 7246, 8170, 8929
  - Cf^{244} 2950
  - Cl$^{34, 38-9}$ 1996, 2016, 2972
  - Cm^{243} 2949
  - Co^{60} 2018, 4977, 9664
  - Cs$^{134, 137}$ 1268, 2018–19, 7213
  - Cu$^{61, 64}$ 8167, 8918
  - Eu$^{152-4}$ etc. 1999, 2001, 3729
  - F$^{17, 20}$ 2005–6, 2947, 8931
  - Ga^{66} 2959
  - Gd isotopes 567
  - H^{3} beta-decay 564
  - Hf$^{175, 179, 181}$ etc. 1991, 2004, 3729, 4650, 6434, 7219, 8946
  - Hg^{197} 1272, 5698
  - Hg^{203}, by new method 8157
  - Ho^{166} 3728
  - I$^{126*, 131}$ 3729, 4647, 4663, 5705*, 6412, 8923, 8933–4, 9661
  - In$^{111, 114-6}$ 587, 2941, 2945, 4652, 7221, 8163
  - Io 4683, 6419, 8951
  - Ir$^{192, 194}$ 2688, 5708
  - K^{40} 1990, 2944, 3722, 3730, 4656, 5725, 6623, 7208
  - Kr$^{79, 85, 89-91}$ 569, 572, 580, 5700*, 6424
  - La$^{131-2, 134, 140}$ 2948, 3729, 5704
  - Li^{8} 2803, 5703, 9662
  - Lu neutron-def. isotopes 4650
  - Mo^{99} 2973, 4642
  - N^{12} delayed α-emitter 2003
  - Na$^{20, 24}$ 1284, 2003, 7210
  - Nb^{99} 1278
  - Nd$^{138-9, 147}$ 2948, 6409, 6431, 7218, 8170
  - Ni$^{57, 59, 63}$ 1274, 4645
  - Np^{236} 6420
  - O^{16} $\rightarrow$ 2Be^{8} 3025
  - Os$^{185, 191, 193}$ 588. 5714
  - P$^{32-3}$ 2011, 8914
  - Pa$^{231, 233}$ 571, 1280, 3729, 6435
  - Pb^{206} etc. 578, 4676
  - Pm$^{145, 149}$ 4654*, 6409
  - Po isotopes 4649, 6439
  - Pr$^{138-9, 142-4}$ 2943, 2948, 3729, 8170, 8929
  - Pu$^{239-42}$ 3721, 3742
  - RaD conversion and Auger electrons 9679
  - Rb$^{86, 88, 90-1}$ etc. 2942, 2974, 2978, 5700*
  - Re^{186} 5707, 7212
  - Rh^{105} 3731
  - Ru$^{103, 105}$ 570, 3731
  - Sb$^{120, 124}$ 590, 2939, 9665
  - Sc$^{44, 46}$ 584, 1269, 6407
  - Se^{75} etc. 576, 3729
  - Si^{30}, proton γ-ray coincidence 8927
  - Sm^{145} 4654*
  - Sn$^{111, 113, 117, 119}$ 595, 4652, 7216, 8163, 8919, 8945
  - Sr^{87m} 2960
  - Ta$^{181-2, 185}$ etc. 1278, 2002, 2941, 3729, 4677
  - Tb^{160} 3729
  - Tc$^{95, 99}$ 2973, 3720, 4642, 4660, 7204
  - Te^{125} 2984
  - Th^{233} beta-disintegration 1998
  - ThD 1969
  - Ti^{45} 1997, 4643
  - Tl^{202} 1271
  - U$^{233, 234, 236}$ 1280, 6404, 6435
  - UY 5706
  - V^{52} 579
  - W^{185} etc. 1278, 2002
  - Xe$^{125, 129, 131, 133}$ 581, 1276, 2000, 4651, 6405 6413, 6424
  - Y$^{87, 89}$ 2960, 8920
  - Yb$^{169, 175, 177}$ 3729
  - Zn^{65} 2018, 8925
  - Zr^{89} etc. 5715, 7214, 8920, 8924
- **electron capture**
  - capture-rate meas., appl. to Ni^{57} decay 1274
  - complete reference tables 2938
  - *K*-capture, γ-ray energy rel. to half-period 3724
  - review 4633
  - calc. from relativistic wave-functions 9283
  - Ag^{105} 1995
  - Am^{239}, branching ratio 565
  - Am^{242}, *L*-capture 1992
  - At^{211} Auger effect 2983
  - Ba^{131} 7220
  - Bk^{243} 2949
  - Cd$^{105, 109}$ 1995, 4684
  - Cs^{131} 7220
  - Cu^{61} *K*-capt./positron branching ratio 8918
  - Ga^{66} 2959
  - Hf^{175} 7219
  - Ho$^{160-4}$ 568
  - I^{126} branching ratio 5705*
  - I^{128} branching ratio 9663
  - In *L*-capture 6416
  - Ir^{192} 5708
  - K^{40} 2944, 4656
  - K^{40}, branching ratio 1270, 3722, 7208
  - K^{40}, coincidence of Auger electrons and γ-rays 9678
  - Kr^{79} 6424
  - Ni$^{57, 59}$ 1273–4, 4645, 6417
  - Os^{185}, *L* to *K* ratio 9675
  - Os^{185}, scintillation studies 7217
  - Re^{186} 5707, 7212
  - Sb^{120} 2939
  - Sm^{145} 4654*
  - Sn^{113} *L* to *K* ratio 7216
  - Sr^{87m} 2960
  - Sr from *d* on Rb 5697
  - Tb$^{153-7}$ 568
  - Xe$^{125, 135}$ 6413, 6424
  - Y^{87} 2960
- **protection** see *Radiation protection*

Radioactivity measurement see also *Radiation monitoring*; and the specific radiation, e.g. *Gamma rays*
- delayed coincidences, effect of counter time-lag 394
- radioactive H in solid samples 563
- liquid samples, precision counting 1261, 9546, 9650
- calorimetric, P^{32} source disintegration 1262
- absorbed energy dist. round beta point source 1263
- atmospheric air, photographic emulsion method 1264
- radio-isotopes, beta emission 1287
- thin Po sources, dosimetry 1987
- beta sources in absorbing media 2009
- solid low-energy beta emitters 2013
- silica gels invest., adsorbed Ra 2140
- spill index, definition 2149
- angular correl. of successive nuclear radiations 2940
- short-lived isomers, delayed coincidence method 2957
- igneous rocks age det. 3227
- radiological units, internat. recommendations 3554, 9877
- wide energy range, review 3555
- spatial location of γ-ray-marked object 3715
- natural rocks, α-particle statist. dist. method 3716
- counting of T 3718
- low-level radiocarbon 4627
- γ-unit at 320 and 160 MeV 4630
- emulsions, microradiographic rock study appl. 4632

- **Radioactivity measurement**—*contd.*
  - Ra and Co^{60} equivalents 4977
  - free air investigation 5941–3
  - standard calibration 6400
  - very short half-lives 6406
  - standard Po source by X meas. 6439
  - in human breath 6665
  - absolute β-counting 7198
  - history of units and standards 7199
  - H^3 assay by CH$^3_4$ counting 7201
  - radioisotopes, spherical dist., dosage 7202
  - β-particles self-absorption correction 7231
  - dose dist. calc., rotating irradiated bodies 7438
  - quantitation of α emitters in bone 8154
  - errors in coincidence meas. of decay 8159
  - absorption corrections for Ra standardization 8911
  - counter estimation of radioactive H as tritiobutane 9115
  - absolute standardization by 4π counting 9648
  - efficiency criteria in counting 9649
  - radioact. isotopes, spec. activity and turnover rates det., errors 9652
  - P^{32} solutions, particulate impurity 9653
  - γ-rays, aerial prospecting 9844
  - beta-rays in solution 9882
  - **apparatus** see also *Cloud chambers*; *Counters*; *Ionization chambers*; *Photography, particle tracks*
    - ion chamber equip. 1123
    - counters and counting systems 1124
    - photo-sensitive counter in scintill. detection 1128
    - u.v. photon counting, electron multiplier 2498
    - gas phase counting 2765
    - scintillation α-counter U and Th est. appl. 3587
    - radioactive survey equip., progress in France 3595
    - electromechanical registers appl. 4134
    - scintillation counter delayed coincidence circuit 5500
    - techniques for X-rays, γ-rays and nucl. and cosmic-ray particles 5684
    - radon meas. device 5686
    - beta-ray dosages above 1 rep/sec 5719
    - very short half-lives meas. 6406
    - qualitative colorimetric dosimeter, penetrating radiations 6538
    - continuous flow counter for human breath 6665
    - non-cryst. fluorescent solids appl. 7035
    - 2 methods for standard dose in Ra therapy 7436
    - soft betas in air, survey-meter 7968
    - artificial radioact. subst., β- and γ-ray spectrometry 8168
    - integrating cryst. detectors 8796
    - active plate sorter 8801
    - samples prep. for end-window G.-M. counter 9651
- **Radiochemistry** see also *Chemical analysis, radioactive*; *Chemical effects of radiations*; *Radioactive tracers*
  - sepn. of U^{239} from (n, γ) reaction 626
  - Os isotopes sepn. from Re 1275
  - separation of Eu from Sm oxide 2001
  - carrier-free Os^{185}, Re$^{183-4}$ from W 2032
  - equilibria in irradiated water 2134
  - Bk separation 2949
  - Cf^{244} separation 2950
  - UX separation methods, efficiency 2961
  - Be^7 isolation from Li 2996
  - Sc$^{44, 46, 47, 48}$ isolation from Ti 2997
  - Zn, Cu, Ni, Co, Fe and Mn separations 3015
  - Sb, Szilard–Chalmers reaction 3757
  - liquid-waste monitoring, evap. method 4012
  - low-level radiocarbon purification 4627
  - sepn. of Th^{234} from Pa 4641
  - product of He$^+$ and d on W 4657
  - carrier-free Mn^{52} prep. 4690
  - Bi$^{204, 206}$ isolation from Pb 4700
  - Mn^{52} from Cr 4701
  - radio-iodine extraction from neutron-irradiated iodobenzene 4731
  - weak neutron fluxes comparison, organic bromides appl. 4761
  - Re^{188} from W^{188} 5699
  - Pd^{103} isolation from Rh 5751
  - C^{14} in CO$_2$–C reaction study 5854
  - extraction of Zn^{65} from Cu 6443
  - neutron-def. Zr isotopes study 7214
  - equipment for remote handling 7434
- **Radiochemistry**—*contd.*
  - n-initiated halogen reactions 8305
  - carrier-free tracers prep. 8954–5
  - Fe^{59} isolation from Co 8966
  - Cr^{51} isolation from V 8967
  - In^{113m} from irradiated unit Sb^{125} 9680
  - S^{35} carrier-free prep., new method 9681
  - Th^{232} fission products det. 9712
- **Radiography**
  - I^{131} diagnosis measurements 2265
  - meas. of density in supersonic flow 2450
  - units, international recommendations 2725, 3554, 9877
  - sensitometry 4019
  - electron-track, liquid-emulsion methods 4021
  - track autoradiography with Fe^{59} and S^{35} 4022
  - dilatometry appl. 4330
  - high-speed, bibliog. 4989
  - shock-waves in solids, liquids and gases 5183
  - neutron-autoradiographic U and Th det., minerals 5807
  - gamma radiography, review 5968
  - cancer, theory 8404
  - nuclear physics appl., review 8405
  - with α's from n-irradiated B 8419
  - glasses transparent to X-rays 9887
  - high-resolution autography 9897
  - γ-rays, in England 9898
  - stereoscopic, true reproduction 9899
  - **accessories** see also *Fluorescent screens*; *X-ray tubes*
    - industrial, film characteristics 4017
    - X-ray fluorescent images intensification 5960
    - cine-radiography, new $f/0\cdot71$ lens 6667
    - 20 MeV, film sensitivity 6669
    - scintillation X-ray monitor 8799
  - **microradiography**
    - electrodeposited metals, electron-microradiography 777, 6672
    - melting Al and Al–Zn, grain boundaries 1351
    - autoradiography resolution testing 2287
    - radioactive inclusions 4632
    - liquid emulsion autoradiography 6671
    - method for deformed metals study 9017
- **Radiometer gauges** see *Vacuum gauges*
- **Radiotherapy** see also *Biological effects*
  - beta sources in absorbing media 2009
  - betatron in cancer therapy 2263
  - simple Ra detector 2264
  - units, international recommendations 2725, 3554, 9877
  - directional scint. counter 3590
  - radiation dosimetry, chem. method 4631
  - u.h.f., physical principles 4975
  - radioact. Co^{60} as Ra substitute 4977, 7435
  - integrating dosemeter 5453
  - max. permissible amount of radioactive isotopes 5959, 8399
  - X-ray dosage 6253
  - 23-MeV betatron appl. 6666
  - radioisotopes dosage calc. 7202
  - skin dose meas. in Ra therapy 7436
  - dose dist. calc., rotating irradiated bodies 7438
  - cancer, theory 8404
  - nucl. physics appl., review 8405
  - scintillation X-ray monitor 8799
  - 22-MeV X-ray treatment of cancer 9880
  - soft tissue and bone dosage 9881
  - hospital physics survey 9882
  - teleradium therapy, developments 9883
  - γ-ray, interstitial, dosage control 9884
  - X-ray, dosage estimation, review 9885
  - dosage est. in fields of any size and shape 9886
- **Radio-wave propagation** see *Electromagnetic wave propagation*
- **Radio-wave spectra** see *Spectra*
- **Radon**
  - collection and purification, remote control 1260
- **Rain**
  - rain formation by coalescence 1543
  - electrical precipitation 1544, 4941
  - AgI ice precipitation, time-lag 1545
  - radioactivity 2216
  - drops, wind tunnel invest. 3382

A complete list of the Subject Headings will be found at the end of the Index.

- **Rain**—*contd.*
  - from non-freezing clouds 3984
  - radar obs., formation mechanism 3985
  - cloud drop enlargement by fusion 3986
  - charges and masses of drops 3997
  - microwave reflection 4546
  - shower cloud structure 4937
  - ice and AgI seeding 4939–40
  - artificial precipitation 4942
  - cloud seeding effectiveness, review 5939
  - cloud-seeding, sunlight effect on AgI particles 5940
  - influence of radioactive air 5943
  - Schaefer–Langmuir seeding technique trials 6641
  - AgI nuclei photolytic inactivation 7350
  - artif. induced, review 7417
  - drop-size, content, balloon-borne meter 8374
  - raindrop spectrograph 9201
  - coalescence of cloud droplets 9214
  - electric charges characteristics 9860
  - origin of electric charge 9862
- **Rainfall** see also *Condensation*; *Snow*
  - airborne radar observation 1542
  - recording raingauge 3970
  - from non-freezing clouds 3984
- **Raman spectra** see also *Luminescence spectra*
  - bulk radiation imaging 935
  - hydrated ions, vibration frequencies 980
  - low temperature apparatus 1756, 4297, 7771
  - intensities of lines in crystals 2562
  - effect of solvent on tetrahedral molecules 2566
  - apparatus for v. small liquid samples 2567
  - rel. intensity meas., refractive index correction 2570
  - influence of substituents on intensity 4296
  - Raman shift in vacuum, calc. 5300
  - birefring. crystals thermal light-scattering 5329
  - recent advances, review 6121
  - rotatory, molec., line width, and Rayleigh line width 6137
  - crystallographic appl., review 6138
  - method of doubling line brightness 6161
  - new scanning equip. 6838
  - mixed crystals, interpretation 6857
  - depolarization factor, symmetric vibrations 8098
  - **inorganic substances**
    - 2nd-order, in aragonite 223
    - quartz, new line 238
    - cadmium tungstate 977
    - frequency direction-dependence in crystals 979
    - anhydrite 981
    - $KClO_3$, temp. variation 982
    - $KHCO_3$, single crystal 984
    - IF_5 and IF_7, directed valency 2146
    - rutile (TiO_2) 2560
    - ice, H-bond vibration spectra 2561
    - S_8 4260
    - condensed NO 4263
    - diborane and $B_2^{10}D_6$ 4282
    - SiF_4 4283
    - NH_4Cl, low temp. 4298
    - NH_3 at 3 300 cm^{-1}, triplet 4299
    - SF_6 i.r. spectrum interpretation 5286
    - MoF_6 and WF 5287
    - calcite, gypsum, barytes 5305
    - phosphorus compounds 6891
    - apophyllite 7769
    - tetramethyl diborane 7771
    - metallic nitrates, solns. 7772
    - gaseous F_2 8110
    - $LiSO_4 . H_2O$ crystal 8652
    - 4 types of glass 8653
    - HF 9374
    - Zn blende 9375
  - **organic substances**
    - 2,3-dibromo–2,3-dimethylbutane and 2,2,3,3-tetramethylbutane 957
    - COClF 963
    - methylchlorosilanes 975
    - ethylchlorosilanes 976
    - benzene, low temps. 978
    - sodium ammonium tartrate 983
    - alternating cyclic chains frequency calc. 1220
    - substituted naphthalene 1222
    - ethane, normal modes 1743

- **Raman spectra**—*contd.*
  - **organic substances**—*contd.*
    - 1,2-dihalogenoethanes, lattice frequencies 1755
    - tetrafluoroethylene, condensed phase 1757
    - CCl_4, photon excited, anti-Stokes freq. abnormality 1758
    - para-difluorobenzene 2529
    - 1,1,1-trifluoroethane 2544
    - cyclopentane, cyclopentane-*d*, and cyclopentane-d_{10} 2545
    - para-di-chloro-benzene 2563
    - l.f., of crystals, with new illum. method 2564
    - *n*-hexane, *n*-heptane, 2-methylpentane, 3-methylpentane, 2,4-dimethylpentane, 2,3-dimethylbutane 2568
    - CD_3–CD_2H 2569
    - 1,2-dihalogenoethanes, rotational isomer theory 2908
    - CH_2BrCH_2Br and CD_2BrCD_2Br 3173
    - $C = O$ vibration freq., rel. to i.r.-absorption det. 3440
    - benzene crystal lattice freq. 3459
    - line intensity temp. dependence, liquids 3460
    - mono-substituted *n*-butane compds. 3461
    - CH_2 vibrational freq., *n*-paraffins 4252
    - vinylidene cyanide 4253
    - trimethylphosphine oxide 4258
    - allene-d_4 4295
    - hexamethylcyclotrisiloxane and octamethylcyclotetrasiloxane 5301
    - naphthalene, low temp. 5302
    - l.f. lines in organic crystals, origin 5304
    - methyl- and dimethyl-hydrazine 6859
    - benzene/oxalylchloride, complexes formation 7699
    - 1 : 3 : 5-trifluorobenzene 7712
    - C and Si tetramethyl and monodeutero derivs. 7713
    - oxalyl chloride 7715
    - *n*-paraffins 7726
    - substituted ethanes 7735
    - diphenylmethane 7767
    - l.f. lines in *p*-dichlorobenzene 7768
    - aromatic monocrystals 7770
    - CH_2Cl_2 and $CHCl_3$ vapour 7773
    - depolarization of lines 8651
- **Random functions**
  - correlated events 16
  - autocorrelation, and power spectra 18
  - noise, statistical models 791
  - speech correl. function analysis 2483–4
  - random walks, Monte Carlo methods appl. 3263
  - first passage time probability problem 4120
  - linear filter study, optical method 4317
  - Laplacian, stationary, harmonic analysis 4995
  - Laplace's probability law extension 5978
  - mean duration of random walks 7452
- **Random processes** see also *Brownian movement*; *Fluctuations*; *Statistical analysis*
  - particle movement, "velocity" 1628
  - gas diffusion calc. 6077
  - dispersion of configurations of linked events 7571
  - noise theory, phenomenological models 9456–7
- **Reaction kinetics** see also *Catalysis*; *Chemical reactions*; *Exchanges, chemical*; *Explosions*; *Reaction rates*
  - styrene/butyl-acrylate system 724
  - U ions exchange reactions 1389
  - OH radicals, flame spectra 1392, 4825
  - reversible reactions, det. 1395
  - catalytic reactions on inhomogeneous surfaces 1418
  - cuprene polymers, growth 1461
  - hydrocarbon flame spectra 1723
  - Hevea rubber cyclization 2116
  - H/O, explosion region 2118
  - FeO reduction by H 2119
  - glucose autoxidation 2120
  - glucose and fructose rearrangements 2121
  - proteins in solution 3108
  - CO/CO_2 isotope exchange 3114
  - OH radicals, from flame spectra 3116
  - atomic H with acetylene 3132
  - non-stationary state invest., diel. method 3509–10
  - polymerization rates and radical lifetimes, diel. method 3511
  - base-catalyzed nitramide and deuterated nitramide decomp. 3856

Reaction kinetics—*contd.*
  parahydrogen conversion 3877
  catalysed polymerization, gaseous formaldehyde 3883
  NH_3–D exchange, microwave method 4815
  styrene polymerization 4823
  chromatography, Jones reductor appl. 4824
  NO, NO_2 and H_2O, gas phase 4829
  chloroform thermal bromination 4832
  phase transition in binary systems 5848
  Ni and Co, oxidation 5856
  adsorption on hydrous ferric oxide, mass action appl. 5884
  thermal decomp. of di-*t*-butyl peroxide 6527
  bond dissociation energies det. 6548
  flow through Laval nozzle 6772
  organic subst. phase change, ultrasonics effect 7329
  gaseous methyl ethyl ketone oxidation 7330–1
  indirect action mech. 7334
  NO + O_3 gas phase reaction 7340
  oxide semiconductors adsorption and desorption 7868
  Ni ferrite formation 8032
  phys. chem. textbook 8280
  OH radicals, oxy-hydrogen flame spectrum 8287
  ordering kinetics in AuCu 8290
  acetaldehyde photolysis 8302
  NH_3/D_2 exchange 9047
  CO_2 comb. with H_2O and OH ions 9050
  acetic anhydride, thermal decomp. 9051
  spectrophotometer for following 9053–5
  oxide film formation, Zn foil 9056
  methylamine thermal oxidation 9761
  intramolec. rearrangements, quantum mech. 9762
  breaking C–H and C–C bonds 9629
Reaction rates see also *Reaction kinetics*
  unsteady-state diffusion 125
  Arrhenius parameters, rel. to structure 692
  Ag corrosion in $FeSO_4$ 704
  in magnetic field 1210
  nitromethane, thermal decomposition 1394
  near equilibrium, rel. to classical thermodynamics 1395
  NH_4NO_3 decompn., O and N isotope effects 1396
  hydrogenation, catalytic 1408
  on non-uniform catalyst surface 1410
  parahydrogen conversion, temp. coeff. rel. to mechanism 1411
  theory, basic assumptions analysed 1416
  activated complex theory and catalysis 1417
  CO/CO_2 isotopic exchange 3114
  SrO reduction by W 3117
  organic substitution, meas. 3855
  wall reactions and diffusion 4154
  radical reactions, calc. 4818
  aralkyl chlorides, solvolysis, intramol. config. effect 4822
  methyl radicals recomb. 4830
  ethane formation from methyl radicals 4831
  H and HT with Cl, rel. rates 4834
  photochem. invest., "high" O pressures 4853
  styrene polymerization, h.f. 5857
  appl. of theory to annealing 6488
  butadiene polymerization 6528
  NiO reduction by W, effect of adsorption 6545
  Ni and Co oxidation, role of oxide 7339
  meas. by conductivity 7341
  relative, C^{12} and C^{13} decarboxylations 7342–3
  NH_3-synthesis on Fe-type catalysts 8291
  isotopic exchange reactions 9043
  Cu low-temp. oxidation, anisotropy 9045
  Np(IV) and (V), oxidation-reduction 9046
  gaseous, apparatus for measuring 9052
  olefinic oxidations, by photochem. effects meas. 9057
  hot ionized gases action on Zr and Cu 9760
  bimolecular reactions in solutions 9765
  acceleration by elec. field 9766
Recombination see *Ions*
Recording see also *Sound recording*
  tracing asymm. hysteresis curves 503
  l.f. phenomena, magnetic tape 2359
  magnetic tape, atmos. elect. field changes 7421
  c.r.o., speed det. with external camera 7442
Recording—*contd.*
  area meas. of photographically recorded figures 8541
  acoustic, ultra high speed 8605
  lecture-room chart plotter 9257
Rectifiers
  Se–Tl rectifiers, forming 1054
  Se rectifier, electric formation 1830
  Se rectifier low-temp. characteristics 1831
  p–n junctions by impurity diffusion 1832
  Se rectifiers, X-ray orientation study 1834
  Ge diodes, reverse current 1836
  Si and Ge rectifiers and nucleon-bombarded semiconductors, survey 2685
  Se rectifiers capacitance 2689
  crystal rectifiers, h.f. diffusion theory 2691
  reverse charac. of Se rectifiers 2697
  Ge rectifiers, electron-bombardment induced 4378
  Ge, *p–n* junction 4380, 9477
  Ge contact-point composition significance 4382
  thermal instability of contact rectifiers 5409
  rectifier d.c. characteristics theory 5410
  barrier-layer rectifiers, theory 5411
  p–n junction 5417
  contact, theory, image-force model appl. 6216
  Se, time-lag effect, origin 6217
  Se, recovery after blocking-direction pulse 6976
  two semiconductors of different type 7853
  Se and alloys, characteristics 7854*
  Ge elec. charac. and anomalies 7862
  Ge films 7873
  asymm. illuminated semiconductive layer 7874
  contact, potl. barrier height, rel. to temp. 7892
  Cu_2O, resistive layer 8730–1
  zincite, volume rectification 8735
  Cu_2S 9467
  cause of rectification, experiments 9472
  temp., pressure effect on barrier 9473
  copper/copper oxide, asymm. heat cond. 9474
  Cu_2O, C, O and S content, rel. to rectifier props. 9476
  barrier-layer, photo. effect 9480
  discharge, effect of electrode p.e. emission 9503
Reflecting microscopes see *Microscopes, reflecting*
Reflection see also *Neutrons, reflection*; *X-ray reflection*
  shock waves in liquids 151
  shock wave near wall 7618
 acoustic waves see also *Echo*; *Reverberation*
  scattered, of plane waves 158
  by parabolic mirror 1678
  spherical, from infinite plane 5202
  nonspecular, from planes with absorbent bosses 5203
  by wedges and corners, theory 9400
 electromagnetic waves
  ordinary and evanescent, from conducting plane 516
  at discontinuity in permittivity gradient 517
  stratified media, thin films appl. 1199, 2575
  microwaves at parallel metallic plates 1950
  by infinite set of plates 3422
  interface or transmission lines, characteristic quantities 3656
  and transmission, metal-plate surface 3658–9
  radio, from ionized gas column 3664
  h.f., from aurora 4004
  microwave, from water spheres 4546
  in inhomogeneous media 4555
  at superconductor 5419
  infinite plane simulation 5608
  radiowaves, by meteor 5988
  stratified media 6141
  troposphere, water-drop electron susceptibility theory 6192
  non-specular, at embossed surfaces 6361
  variational principle for coeffs. 7117
  internal, troposphere appl. 7128
  ionospheric irregularities, plasma resonance 7132
  v.l.f., at ionosphere surface 8861
  pulses, by wedges and corners, theory 9400
  inhomogeneous media 9620
 light see also *Mirrors*; *Optical films*
  diffuse 208
  differential phase change 226
  from thin films, phase change study 227, 1762, 2575, 4308
  labradorite iridescence 733

Reflection—*contd.*
 light—*contd.*
  quadripole theory appl. 986
  diffuse, by planetary atmos. 2322
  phase-contrast exam. of polish on glass 2595*
  by object in fog 3238
  by infinite set of plates 3422
  polarized light study of metals 3465, 4302–3
  Zn light-figure orientation det. 4890
  near total reflection angle 5307
  at thin medium, not near total reflection angle 5308
  phase change at mica-Ag interface 5309
  at Ag, phase change rel. to incidence angle 5312
  reflection-reducing films, colour 5313
  reduction by multiple-layers 5318
  MgO diffuse reflectance 6133
  gloss meas., luminance factor 6142
  interferometer phase change dispersion correction 6143
  formulae generalization for arbitrary wave-form 6823
  selective, alkali metal vapours 7757
  multiple thin and thick films 8656
  metal films on non-absorbing backing 8657
  by wedges and corners, e.m. theory 9400
Reflectivity see also *Diffusion, light*; *Optical films*
  Hg vapour reflection factor 182
  evaporated Al–Ag, Al–Mg films, coeffs. 225
  thin Ag films 229, 5316–17
  semi-transparent films, optical constants det. 987
  complex coeffs. ratio, polarimetric det. 4304
  metallic films, tables 5314–15
  spectral, meas. 7656
  Si and Ge, i.r. 7882
  Na glass 8637
Refraction
  of ocean waves 3379
 acoustic waves
  shock waves in liquids 151
  waves in anisotropic propagation conditions 1667, 5176
  shadow zone rel. to surface vel. gradient 1680
  by cloud droplets 2215
  0·1 c/s in ionosphere 4007
  steel plates in water 5184
  in compressible, variable-velocity fluid 7586
  in heterogeneous material, review 7628
  pattern display, photographic method 9352
  ultrasonic
  in polycrystals 1669
  ultrasonic vel. meas. appl. 6800
 electromagnetic waves see also *Electromagnetic wave propagation*
  in stratified media, thin films 1199, 2575
  ribbon elements gratings, non-reflective lens 1951
  metal plates dielectric, theory 3663
  air, r.f. 4219
  stratified media 6141
 light see also *Double refraction*
  rel. to incidence angle and refract. indices 928
  marginal, in ice clouds 3990
  near total reflection angle 5307
  thin medium, not near total reflection angle 5308
  dispersion theory, molecular crystals 7722
 neutrons see *Neutrons, refraction*
Refractive index see also *Dispersion, optical*; *Double refraction*
  AgCl, visible and i.r. 175
  glass, internal stress effect 269
  LiF 933, 2575, 3426, 9362
  MgO, temp. variation 934
  air, dispersion curves 1720
  correction in rel. Raman intensity meas. 2570
  fluorides of Mg, Cu, Li and Al, cryolite, SiO_2, TiO_2 2575
  solvent and solution differences in mol. wt. det. 2589
  $CaCl_2 . 4H_2O$ crystals 3187
  ethylene diamine tartrate 3946
  glasses, temp.-dependence fluctuations 4231
  solution and solvent, rel. to scattering 4313
  amorphous Se, infra-red 5238
  rock salt, temp. coeff. 5244
  Na stannate 5924
  rel. to radiation pressure 6092
Refractive index—*contd.*
  rutile, sphalerite 6557
  Si and Ge, i.r. 7882
  CS_2, low temp. 8072
  glasses, molar refractivity 9109
  Se, red and i.r. 9361
Refractive index measurement
  thin films, 988–9, 2575, 5311
  gases, from absorption data 1715
  fluorite 7 to 15μ 2576
  immersion method, thin sheets 2582
  thin film mixtures 3427
  using prism reflections 4230
  calcite, 5–14μ region, interference spectra 5236
  liquids, i.r. 5237
  quartz, mica, CCl_4, by i.r. refl. spectroscopy 5270
  metallic films, tables 5314–15
  ZnS evap. films 5818
  CS_2, i.r. 6830
  in concentration gradient studies 6831–3
  gas mixture homogeneity indication 7660
  interferometry technique, review 7780
  by interferometer, liquid diffusion 9397
Refractometers
  phase-shift, for atmos. air 4557
  biol. appl., review 6655
  non-stationary state chem. reactions invest. 6834
  interferometry technique, review 7780
Refrigerators see *Low temperature production*
Relativity
  relativisitic wave-particle, Galilean approximation 89
  e.m. field gravitational energy 829
  Minkowski's moving bodies electrodynamics 830
  fundamental particles, relativistic and statistical distinction 860
  surface area and electrodynam. boundary conditions, moving bodies 3311
  historical survey 6015
  e.m. induction avoidance of paradoxes 5089
  theory of quanta, arbitrary constants elim. 6728
  relativistic optics, phase and group vel. 6821
  and de Broglie wave-eq. 7553
 general see also *Cosmology*; *Gravitation*
  complex tensor calculus 1
  matter in deformed de Sitter universe 20
  expanding universe test 21
  scalar matter-field, metric field influence 825
  extension of spinor field theory 843
  mass of rotating cylinder 1596
  equations of motion 2361
  rotating disk, space-time 2362
  stationary closed universe impossibility 3316
  equations of motion, co-ordinate condition 3317
  thermal and gravitational fields, geometries 3318
  rel. to unif. field theory 4072
  particle motion 4074
  extended gravitation theory 4076
  creation of matter 5010
  5-dimensional theory 5062
  with e.m. field, conservation laws 5066
  cosmology theory, review 5982
  gravitation theory, non-symm. generalization 6019
  time slowing-down by gravitational field 6721
  radiation and gravitational eq. of motion 6722
  gravitational transverse-transverse waves 6726
  nebulae recession, two-colour indices 9247
  spinning "test particles" 9259–60
 kinematical
  gravitation and magnetism rel. 3314
  cosmological scales time variation 4041
  6-vector development of some results 8493
 special
  constrained and unconstrained systems 63
  consideration of 2 postulates 3313
  discrete space-time and Lorentz transformations 4073
  e.m. induction deriv. 4539
  disk rotating in Galilean system 6017
  clock paradox 6018, 9262
  reflection of light from moving mirrors 8609
  relativistic kinematics 9261
 unified field theories
  Weyl's and Einstein's theories discussed 62
  fundamental equation deriv. 826, 5065

- **Relativity**—*contd.*
  - **unified field theories**—*contd.*
    - fundamental equation soln. 827, 5065
    - field equations 828, 5065
    - with electromagnetic field, Hamiltonian 847
    - Birkhoff's field and e.m. and pair fields, interactions 1610
    - new Einstein theory and motion eq. 2360, 7502
    - Einstein's new theory, eq. 3312
    - geometrical model 3315
    - rel. to gen. relativity theory 4072
    - Bianchi identities in gravitation theory 4075*
    - eq. of 2nd approx. 5063
    - affine field expressions 5064
    - "conformal" theory 5067
    - peculiarity in Einstein's theory 6016, 7503–4
    - elementary particles, geometrical introduction 6028
    - differential identities of an affinity 6723
    - action as space coordinate 6724
    - gravitational waves 6725
    - Einstein's field eq. for energy-radiating fluid spheres 6727
    - gravitational and e.m. fields, mutual action 7505
    - Jordan–Thiry theory, existence theorems 7506
    - eq. compatibility 8494
    - quaternion treatment 9288
- **Relaxation** see also *Acoustic wave propagation*; *Dielectrics*; *Differential equations, relaxation methods*; *Elastic relaxation*; *Magnetic relaxation*; *Molecules, relaxation*
  - frictional oscillations 1383–4
  - internal friction in Cu single crystals 1385
  - vibrations absorption in β-brass 2466
  - visco-elastic behaviour 3094–5
  - relaxation oscillations, amplitude bounds 3404
  - single-crystal recovery 3826
  - stress, flow of conc. polymer solutions 6054–5
  - of semiconductors photoconductivity 6225
  - in β-brass problem 6493
  - processes in solids, pulse-annealing study 8272
  - relax. times dist. function, rel. to creep 8273
  - "relaxation spectrum" in plastic-elastic invest. 9028
  - spectrum for rubber 9753
- **Resistance, electrical** see also *Conduction, electrical*; *Contact resistance*
  - tin-oxide coated glass, temp. coeff. 305
  - semi-conductors with acceptors and donors 308
  - Ge, low-temp. 310
  - semi-conductors, low-temp. 311
  - change by working at liquid-air temp. 328
  - current heating effect; Wiedemann–Franz number det. 329
  - internal, of galvanic cell 700
  - thermistor resistance/temp. rel. 1063
  - Ag–Mg alloy, and phase 1355
  - Sb films 1827
  - $BaTiO_3$ and its solid solns. 1828
  - MnBi ferromag. alloy, low temps. 1925
  - Si–Fe magneto-resistance 1954
  - Rehbinder effect invest. 2112
  - Ni amalgams 2612
  - cold-rolled metals, anisotropy 2680
  - Ge, press. dependence 2688
  - Bi, large mag. field meas. appl. 2819
  - soft mag. materials, thermo-magnetic influence 2876
  - Bi layers 3516
  - anomalous changes in alloys 4374
  - Mg low temp. min. meas. 4376
  - Pt at high temp. 4377
  - Bi, change in mag. field 4562–3, 5620, 8076
  - Au evap. film, lattice distortion spectrum 4783
  - rel. to comp., alloys 4806
  - rectangular plate, internal electrode, calc. 5401
  - semiconductors, calc. 5406, 7877
  - low temp. minimum in Au 5418
  - Bi, in mag. field, rel. to Corbino effect 5621
  - Se, heat treatment effect 6208
  - Fe films, low temp. 6209
  - semiconductors, effect of press. 6213
  - variations at melting pt. 6226
  - wire, effect of stress 6229
  - press. effect on metals and intermetall. compds. 6230
  - ferromag. metals in mag. field, low temp. 6368
- **Resistance, electrical**—*contd.*
  - Seignette salt, new temp. relations 6958
  - semiconductors, dispersion at audiofreq. 6964
  - graphite bisulphate 7301
  - change under tension, Poissons ratio meas. 7319
  - intermetallic compds. 7849
  - thin oxide films, invest. 7852
  - Se with various impurities 7854*
  - combination, in semiconductors 7875
  - metals, θ values theory 7902
  - films containing gaps, temp. dependence 8726
  - Mn–Ag alloys, low temp. 8727
  - Mn–Ag alloys, low temp., mag. field 8744
  - in mag. field, low temp. ferromag. metals and alloys 8866
  - Na_xWO_3 9463
  - Ge p–n junctions, press. and temp. effects 9477
  - thin films, change with temp. and field strength 9479
  - one-phase monovalent metals, rel. to temp. 9483
- **Resistance thermometers** see *Thermometers, resistance*
- **Resistivity** see *Conductivity*
- **Resolving power, optics** see also *Optical instrument testing*
  - rel. to aperture information transmission 233
  - microscope, condenser influence 247
  - visual, for double stars 769
  - spectrometers, on communication theory 6100
  - limits, theoretical study 6824
  - human eye 8393
  - spurious resolution of lenses 8612
  - visual, from energy point of view 9872
  - lens-film combination, optimum 9889
- **Resonance spectra** see *Spectra, resonance*
- **Resonators**
  - **acoustic**
    - wavelength calc. 5212
    - damping 6812
  - **electromagnetic** see *Electromagnetic oscillations*
- **Reverberation** see also *Architectural acoustics*; *Echo*
  - coupled rooms 167
  - Radiodiffusion Française studios 917
  - in architectural and microphone acoustics 1707
  - synthetic, for opt. reverb. time det. 1708
  - absorption coeff. det. method 1709
  - ultrasonics absorpt. in liquids, meas. method 4188
  - automatic meas. app. 6090
  - in ocean, due to temp. irregularities 8594
  - helical spring study 8602
  - ultra speed recording 8605
- **Rhenium**
  - secondary electron emission 2754
- **Rheology** see also *Plasticity*
  - rheological and electrical behaviour rel. 711
  - lubricant films 866, 3848
  - dielectric polymers, properties and meas. 1378–9
  - adhesives gelation, rheological changes 1380
  - cheese tests, factor analysis appl. 3265
  - rheol. aspect of hydrodynamics 3831
  - flow of non-Bingham plastic solids, non-Newtonian viscous liquids 5828
  - instrument for invest., theory 6517
  - description using convected coordinates 8277
  - dispersed magnetized particles 8721
  - elastic dispersions, flow props. 9027
  - incompress. elasto-viscous medium, eq. of motion 9034
  - secondary stresses in viscoelastic flow 9035
  - of emulsions and suspensions 9075
- **Rhodium**
  - filters, density control 4782
  - magnetic susceptibility 5575
  - deposition on Perspex 5817
  - evap. film, elec. cond. 7887
  - abs. energy loss of 18 MeV protons 7956
- **Rivers**
  - vegetation evaporation influence 7416
  - tide propagation 7593
- **Rochelle salt**
  - piezoelectric appl. 302
  - domain structure 1041
  - noise, Barkhausen effect 1822
  - purification, effect on ferroelectric properties 2668
  - elastic constants, ultrasonic method 3089

A complete list of the Subject Headings will be found at the end of the Index.

Rochelle salt—*contd.*
    mech. twinning 3191
    h.p. moulding for crystal plates 3900
    piezoelectric characteristics 6955
    new temp. relations 6958
Rock salt
    blue and violet, discoloration 734*
    isothermals from thermal expansion 1027
    epitaxial growth of Ag 3907, 5930*
    bent-crystal technique 4419
    refract. index temp. coeff. 5244
    K absorption band study 6134
    colour centres by α-rays 9407
    ditto, with colloidal Na 9408
Rockets
    space-rocket trajectories 102
    motors, stability of flow 103, 6051
    V-2, spectroheliograph appl. with automatic tracking 793
    speed limit? 3351
    long-range, accuracy 5137
    high alt., temp. barrier 6049
    H as fuel 6186
    upper atmos. research 6624
    ballistics, perturbation calculus appl. 6762
    orbital, design problems 6763
    combustion in motor 6764
    aerodynamic heating 7613
    exhaust flame, spectroscopic vel. and press. meas. 7814
Rotating bodies see also *Centrifuges*; *Earth*; *Gyroscopes*
    mass of rotating cylinder 1596
    disk rotating in space 2362, 6017
    motion relative to rotating earth 4123
    stability of Saturn's rings 7461
    accompanied by electric currents 9258
Rotatory power, dispersion see *Optical rotation*
Rubber
    l.f. ultrasonic wave propagn. 165
    natural, stress-strain properties 666
    swelling under strain 715
    vulcanized, Gough–Joule coeffs. rel. to moduli 1361
    elasticity, theory 2087
    high-elascitity characteristics 2088
    statistical cyclization kinetics 2116
    and GR–S, thermal conductivity 2598
    friction on ice 3106
    vulcanized, volume changes on stretching 3822
    large deformations, appl. of theory 5825
    strain round hole in sheet 5826
    visco-elasticity, theory 6506
    transitions, stress-temp. studies 6507
    finite strain theory appl. 6509
    rubber-like matls., physics 6549
    relaxation spectrum 9753
    reinforcement by C black 9754
Rubidium
    photo ionization cross-section 8144
    eq. of state 8707
Rubidium iodide
    exciton-enhanced photoelec. emission 4391–2
    F-centres energy distrib. 6973
Rubidium phosphate
    elastic constants, ultrasonic method 3089
Ruby
    colour, theory and verification 1475
Ruthenium
    as superconductor 2703
Rutile
    refractive index 6557
***S*-matrix theory** see *Quantum theory, S-matrix*
Samarium
    amalgam, magnetic susceptibility 1922
Sampling see *Statistical analysis*
Sapphire
    sapphire-glass seal, i.r. photocell appl. 6910
    sapphire-glass seal, h.f. induction method 6911
Scales
    classification, review 9255
Scales, instrument
    estimation of tenths 3310
    superimposed electrophoresis coordinates 7911
Scales, musical
    organ with Huygens' tuning 5207
Scattering
  acoustic waves
    plane wave from nonabsorbing sphere 5204
    acoustic strip 5205
    by solid cylinders and spheres 6810
    by screw dislocation 9344
  electromagnetic waves
    random, ionosphere diffracting centres 766
    radiowaves, tropospheric 1547, 8857
    by atmospheric turbulence 2219
    radio waves at earth's surface 3657
    plane, by soft spheres 4312
    from spheres comparable to wavelength 5604
    radio signals attenuation 5611
    u.h.f., opalescent binary liq. mixtures 5615
    long-distance 8855–6
  light see also *Diffusion, light*; *Raman spectra*
    by Perspex, elliptic polarization 237
    thermal, in quartz 238
    spectrophotometry of colloidal solns. 709
    coherent scattering by atom, theory 846
    phase change by thin films 1762
    Rayleigh, of crystals, calc. 1774
    depolarization by shellac solns. 1775
    polystyrene mol. wt. det. 1776
    high mol. wt. det. photometer 1777
    by liquids, influence of absorption 1778
    polarization, aerosols meas. appl. 2139
    sunlit sky, polarization 2222
    by quartz, Brillouin components 2583
    critical, for fluid systems 2585
    2-component liquid system opalescence 2586
    in polymer solutions 2587–8
    mol. wt. det., refractive index effects 2589
    liquids and solutions, abs. intensity 2590
    on vapour and ice particles 3235
    in small-angle diffraction, glass cube 3466
    by liquids, polarization 3467, 5335
    differential nephelometer 3468
    ang. distrib. of radiation at medium interface 3799
    i.r., in turbid atmosphere 3987
    i.r., by atmospheric salt nuclei 3988
    atmospheric, by haze and ice particles 3989
    plane waves by soft spheres 4312
    solutions, refractive index different from solvent 4313
    sky, photometric obs. 4917
    in special sky regions 4949
    by particles in Mars atmos. 5016
    Rayleigh constants in gases and liquids 5327
    anomalous small-angle diffraction effects 5328
    thermal, in birefring. crystals 5329
    by colloids 5330
    colloidal electrolytes, gegenions effect 5331
    by anisotropic, rodlike particles 5332
    by strong electrolytes solns. 5333
    spherical particles, polarization coeffs. 5334
    coiling polyelectrolytes study 5892
    brightness distrib., dispersing media 6150
    coherent, by monocrystals 6152
    protein solutions, progress review 6655
    stray light det. for gratings, etc. 6899
    geometrical factors in apparatus 6901
    Na silicate solutions 7353
    of light by light 7524
    coloured solns. meas., absorption correct. 7758
    gases, depolarization factors 7784
    by liq. droplets 7785
    by bound electron 8148
    nematic-type liq. crystals 8663
    sunlight by earth's atmos. 9216
    on large particles, coeff. 9217
    by large drops, and rainbow polarization 9218
    anisotropic molec., liquids, rotational vibr. 9311
    in atmosphere, review 9847
  X-rays see *X-ray scattering*
Scattering, particles see also *Collision processes*; *Nuclear forces, scattering*; *Quantum theory, S-matrix*; and under individual particles, e.g. *Alpha-rays*
    cosmic-ray, statistical estimation 412
    spin interaction influence 839
    spin $\hbar/2$ particles, diffusion 841

Scattering, particles—*contd.*
  nucleon-nucleon, and spin-orbit interactions 852
  positive-track-producing particles, multiple scattering 1285
  Klein–Nishina formula corrections 1298
  variational methods 1616
  effects, in particle accelerators 2760
  nucleons, *S*-wave, by deuterons 3001
  Feynman's formulation and Born approx. 3339
  electron, wave-statistical treatment 3343
  back diffusion, geom. calc. 3571
  meas., in photo plates 3580
  generalized, double Compton, theory 4092
  int. excitation and app. range, nuclear forces 4093
  gauge-invariance consequences for radiative transitions 4094
  interaction effects on radiative transitions 4095
  multiple, in cloud chamber (erratum) 4451
  fast, multiple, in emulsions 4497, 5733
  nuclear reaction description, boundary conditions 4688
  quantum mech. textbook 5069
  scattering losses in synchrotron 5473
  multiple, heavy nuclei, in photo emulsion 5532
  track meas. in emulsions, elimination of spurious 5732
  general theory, new presentation 6027
  scattering and reaction cross-sections, angular dependence 6737
  quantum theory, asymptotic phases 6743
  by static potential 6747
  connection of *S*-matrix with causality 6749
  by ordered fluids 6750
  multiple elastic, radiation damping 7535
  wave function phase 7563
  in potential-well 7565
  ionizing particles in emulsions, positrons 7941
  cyclotron targets, multiple traversal 7946
  multiple Coulomb, phot. meas. 7953
  multiple, in emulsions, scattering const. value 7954
  polarized, ang. distrib., formulae 8180
  high-energy nucleons by heavy nuclei 8181
  highly ionizing, emulsions study 8183
  charged, by electrostatic interaction with nucleus 8218
  2-nucleon systems scatt. phase shifts 8234
  2-pronged stars 8787
  free magnetic poles 8833
  effect on ang. correl. meas. 8913
  approximation method for sq. well potl. 9278
  in emulsions, overlapping cells sampling method 9231
  classical Rutherford, geom. characteristics 9536
Schlieren systems
  Schlieren diagram reference wedge 243
  2-dimensional coloured Schlieren apparatus 1003
  electron optics 3559
  stereoscopic 4992
  optical det. of acoustic vel. in solids 6800
  in photograph study of rapid events 7443
  colour, phase-contrast method 8670
Scintillation counters see *Counters, scintillation*
Seals see *Glass-metal seals*
Seawater
  acoustic wave propagation, review 2236
  $MgSO_4$ aq. soln. ultrasonic absorpt. 4189
  sound velocity determination 5180
  brightness distribution 6151
Secondary electrons see *Electron emission, secondary*
Secondary emission see *Electron emission, secondary*
Sedimentation, colloids
  suspensions 865
  long-chain molecules in soln., hydrodynamics 1437
  polystyrene in soln. 1439
  rough powder suspensions 2408
  particle shape and conc. dependence 4855
  interfacial tensions, flotation 6060
  conc. polymer solutions, equilib. 6070
  coagulation and deposition, stirred aerosols 8308
  sarcosine polymers 9098
  particle fluid dynamics 9738
  constants det. from Fresnel diff. patterns 9782
Seismic waves see also *Seismology*
  velocity dependence on depth and lithology 1523
  velocity over short distances 3950
Seismic waves—*contd.*
  S waves travel-times in inner core 3952
  surface, dispersion 3956
  variable-velocity, refraction 3957
  P and *pP*, energy content 5934
  artificial, e.m. source 5935
  vel., rel. to depth and geol. time 6604
  normal mode propag., 3-layered liq. half-space 6605
  Zenneck ground wave 7395
  travel time, calc. 9181
  phase *PKJKP* theoret. amplitudes 9840
Seismographs
  photoelectric type 1522
  electromechanical testing transducer 1524
  absolute calibration 3216
  2 portable types, theory and design 3953
Seismology see also *Geophysical prospecting, seismic*; *Microseisms*; *Seismic waves*
  focal depth determination 756
  gravity data from boreholes 1529
  solar influence theory 2191
  detonation hypothesis 3127
  earth tide 3228
  k and ν_0 determination 3949
  seismograms *S*-phase polarization 6603
  refraction experiments 6606
  earthquakes and rock creep 6607
  crustal layers comp. change theory 9841
Selenium
  photocells, spectral sensitivity 316, 1060
  metallic, electroplating 694
  Se–Tl rectifiers, forming 1054
  contact, electrical forming study 1055
  rectifier, low temp. characteristics and electric formation 1830–1
  rectifiers, X-ray orientation study 1834
  Se rectifiers, capacitance 2689
  rectifiers, characteristics 2697
  single crystal, Hall effect 2875
  monoclinic, cryst. struct. 3924
  coatings, elec. props. 4387
  infra-red properties 5238
  rectifiers, theory 5410, 6216
  physical props. 6208
  rectifiers, time-lag effect origin. 6217
  photoconductivity relaxation 6225
  red, photoconductivity charac. 6972
  single crystals, elec. props. 6975, 7878
  rectifiers, recovery 6976
  photovoltaic cell, electron bombardment effect 7021
  and alloys, rectifying characteristics 7854*
  blocking-layer cells resist. and e.m.f. 7871
  micro-cryst. with I impurities, elec. props. 7879
  thermo-elec. props. 7886
  crystallization lattice defects formation 7888
  engineering and chemical aspects 7891
  α-monoclinic, thermal expansion 8684
  optical props. 9361
Selenium oxide
  chemical method for production 7356
Semiconductors see also *Conduction, electrical*
  barrier layers, oscillograph invest. 306
  unipolarity and applied voltage 307
  with acceptors and donors, resistivity 308
  Mn ferromagnetic compds. 309
  Ge low-temp. resistivity and Hall effect 310
  resistivity and Hall effect, low-temp. 311
  Ge energy gap temp. dependence 312
  grey tin 313, 1048, 3524–5, 7869
  contact noise theory 314
  neutron-irradiated, thermal equilib. 315
  alkali-Ge compds., photo-effect 317
  MoO_3 1049
  β-Cu_2S anomalous electrical properties 1050
  neutral impurity scattering 1051
  nature of soldered contact 1052
  Ge and others, electron and hole flow theory 1053, 4381
  Se contact, electrical forming study 1055
  ZnO, rel. to surface reactions 1056
  non-polar crystals, deformation potentials and mobilities 1057
  Ge point contacts, rel. to hole concentration 1058

Semiconductors—*contd.*
  Cs–Sb layers, photoelectric emission 1062
  variation due to adsorbed gases, rel. to catalysis 1400
  Cu oxide surface reactions invest. 1413
  photoconduct. kinetics invest. 1833
  CdSe properties 1835
  quantum yield of internal photoeffect 1839
  Mg_3Sb_2 layers 1843
  in variable-valency ion study 2123
  sheets, electric-field mapping 2655
  compound, current carrier diffusion 2684
  Al–Al_2O_3–electrolyte system, dynamic charac. 2668
  Ge conductivity changes, alpha-particle-induced 2687
  Ge resistance pressure dependence 2688
  graph. det. of Fermi level 2690
  lattice-defect and diffusion processes 3518
  impurity band conduction mechanism 3519
  mobilities in high fields 3520*
  n-type Ge, point contact inverse voltage characteristic 3521–2
  Ge, heat treatment effect 3523
  Ti single crystals 3526
  Hall coeff. 3527
  Pb silicate glass, H-treated 3528
  $NiOFe_2O_3$ microwave resonance absorption 3628
  n-type Ge hole diff. meas. 4379
  trapping centres aggregation 4383
  bornite, characteristics 4384
  Ge single-crystals growth invest. 4385
  magnetite sp. heat and Hall effect 4526
  Te, Ettingshausen–Nernst effect 4565–6
  amorphous coke 5350
  barrier layers in alloys 5404
  impurity content meas. 5405
  resistivity and Hall constant calc. 5406, 7877
  degenerate, temp. variation 5407
  I.v. absorption and intrinsic semiconductivity 5408
  galena mesh and funnel cells 5413
  thin films, thermionic emission 5510*
  adsorption of gases 5882
  Se props. invest. 6208, 7878
  Fe films, low temp. 6209
  crystals, non-ideal electron-gas excitations 6210
  conductivity calc. 6211
  effect of press. on resist. 6213
  parameters, graph. eval. 6214
  thoria *in vacuo* 6215
  pure Te film 6218
  relaxation of photoconductivity 6225
  thermo-e.m.f. rel. to temp. difference 6231
  thermionic emission 6291
  same type conductivity, contact, theory 6960
  simple *p*-type, theory 6961
  energy gap temp. dependence 6962
  ZnO, elec. props. 6963
  resistivity and diel. const. dispersion, audiofreq. 6964
  n-Ge transistors, electric forming 6966
  Ge, PbS, surface thermo-electric effects 6968
  Ge, effect of fast neutrons 6969
  background noise limit to photoconductor performance 6970
  Pb telluride film 6974, 7885
  ionic crystals, electrical characteristic 7842
  two of different type, contact theory 7853
  semiconducting matls., conf. rep. 7855
  theory, survey 7856
  Si impurities, energy states 7857
  new phenomena of electronic conduction 7858
  surface phenomena 7859
  nucleon bombardment effects 7860
  PbS contact expts. 7861
  irrad. alkali halide crystals 7863
  electrons and holes motion, AgCl 7864
  oxidic, theory of characteristics 7865
  (La, Sr)MnO_3, props. 7866
  ZnO elec. and opt. props. 7867
  oxides, rel. to O adsorption 7868
  Pb sulphide and telluride, temp. dependence 7870
  Se blocking-layer cells resist. and e.m.f. 7871
  galvanomag. effects theory 7872
  combination of resistivities 7875
  internal barriers 7876
  micro-cryst. Se with I impurities 7879

Semiconductors—*contd.*
  CdO and NiO, props. 7880
  PbS, O and heating-rate influence 7881
  Si and Ge i.r. optical props 7882
  Ge work function 7883
  BaO crystals 7884
  some sulphides, selenides and tellurides 7885
  Se thermo-elec. props. 7886
  evap. metal films 7887
  semi-metals crystallization 7888
  PbS crystal triode action 7889
  transistors, effect of auxiliary current 7890
  engineering and chemical aspects 7891
  photo-effects in PbS 7894*–5*
  Ni ferrite, microwave resonance absorption 8026
  magnetite single crystal, microwave reson. absorpt. 8027
  Ni ferrite, elec. and mag. props. rel. 8032
  non-polar, energy gap temp. dependence 8083
  light emission by SiC 8654
  mixed conductivity, theory 8732
  αFe_2O_3 with Ti 8736
  contact resist., rel. to contact p.d. 8737
  electron theory, review 8872
  HgSe/Se solid soln. 9468
  PbS, lattice disorder 9469
  PbS, intrinsic 9470
  change of activation energy by impurities 9471
  Si impurity centres 9475
  effect of pressure on barrier-layer 9473
  book review 9478
  electron theory of crystals 9625
Series
  heat conduction, solid, surface temp. soln. 250
  transformations to speed convergence 3254
  search for periodicities 6678
  linear recurrent relations of coeffs. 8424
  electron path-length problems 9460
Shock waves see also *Explosions*; *Supersonic flow*
  propagation in solar atmosphere 33
  spherical blast propagation 150
  finite pulses in liquids 151
  flame propagation, composition limits 1014
  energy behind decaying shock 1673
  magneto-hydrodynamic shocks 1945
  density meas. by X-rays 2450, 5183
  oblique, turbulent boundary-layer reflect. 2451
  liq. He, pulse technique 2631
  "temperature" waves in liq. 2633
  in detonation, review 3118
  similarity solutions in detonation 3119
  detonation study, photographic technique 3122
  in exploding star 3300
  at sharp leading edge 3401
  condensation of water 3490
  detached, for revolute flows 4166
  in compressible flow, review 4167
  apex curvature, axially-symmetric flow 4169
  in A and N, rotational relaxation data 4184
  general consistency relations 5181
  in waterlike substances 5182
  curved shock, vorticity theorem appl. 6058
  source of light, explosives detonated in air 6524
  propagation in stellar model 6714
  Boltzmann eq soln. 6801
  converging, production and stability 6802
  outside linear charge, photog. recording 7337
  interaction with boundary layers 7617
  reflection, near wall 7618
  meas., vibration recorder 7626
  chem. ignition of thermonuclear reactions 8288
  effect of acoustic relaxation 8579
  due to rigid wedge, supersonic rel. 8581
  due to rigid cone, supersonic rel. 8582
  initiation of detonation 9049
  forked compression shock theory 9332
  curvature ahead of obstacle 9334
  formation delay by interaction 9345
  refl. at corner, pseudo-stationary flow 9346
  collision, ionization study 9347
Shot noise see *Fluctuations, electrical*
Showers see *Cosmic rays, showers*

Silica
    thin film, refractive index 2575
    fused, thermal conductivity 2599
    dielectric permittivity 6197
    gel, absolute adsorption isothermals on 6546
Silicon
    crystal rectifiers 2685
    Si–Ge achromatic doublet 6827
    photoconductivity charac. 6972
    energy states of impurities 7857
    semiconductor theory 7858
    semiconductor surface phenomena 7859
    semiconduct., engineering and chem. aspects 7891
    i.r. optical props. 7882
    semicond., energy gap temp. dependence 8083
    p–n junction, current amplification 8740
    impurity centres theory 9475
Silicon carbide
    position of Fermi level 2690
    low-temp. Hall effect, mechanism 3519
    "injected" light emission 8654
Silicon fluoride
    molecular force consts., thermodyn. props. 8881
Silicon sulphide
    semiconductor, irradiation effect 7860
Silicon tetrafluoride
    force field 8090
Silicones
    polar. surface properties 1454
    diamag. props. 5585
    oil vapour effect on secondary electron emission 7019
Silver
    layers, optical properties 227
    thin films, interferometric appl. 229
    salts, magnetic study 489
    ion self-diffusion coeff. 657
    diffusion rate in Cu and Au 659
    corrosion rate in $FeSO_4$ 704
    thin films, electrical cond. in intense fields 1047
    Cs_2O, Ag, Cs layers semi-conductors 1062
    film formation, electron microscope study 1349
    film, as orientated overgrowth 1350
    films, optical properties 1763
    filaments and dendrites growth 2276
    colloidal, natural colour photography 2290
    elec. resist. at low temp. 3531
    epitaxial growth on rock salt 3907
    film on mica, phase change invest. 5309
    Ag–glass and Ag–air reflections, phase change 5312
    films, optical const. det. 5316–17
    lattice and grain-boundary self-diffusion 5815, 7307
    films on NaCl 5906, 5930*
    films, thickness meas. 6144
    Poissons ratio from elect. meas. 7319
    annealing powders without sintering 7440
    abs. energy loss of 18 MeV protons 7956
    effect of deformation on elec. resistivity 9496
    periodic oscillations during electrolytic solution 9771
Silver bromide
    high-temp. sp. ht. 4350
    use in crystal counters 5495
    lattice defects, sp. ht. data 5908
    lattice defects, expansion 5921
    internal photo effect and light absorption 7899
    electrical conductivity 9464–5
Silver chloride
    refractive index, visible and i.r. 175
    single crystals, elastic const. det. 670
    thermal conductivity 2599
    crystal, thermal expansion 3189
    electron mobility det. 6959
    electrons and holes motion 7864
    internal photo-effect and light absorption 7899
    crystals, dielectric breakdown 8758
Silver halides
    layers, light absorpt. invest. 1764
    F-centres role in emulsion photosensitivity 6678
    photo-conduction relaxation props. 8739
Silver iodide
    ice precipitation, time-lag 1545
    ice-forming nuclei, photolytic inactivation 7350
    electrical double layer 9072
    photog. props., rel. to photoelec. props. 9222
Silver nitrate
    infl. of mag. field on crystallization 9808
Sintering
    dilatometer study 1337
    grain boundaries and pore dist. 2078
    A.E.C. solid-state metall. 4770
    avoidance during annealing 7440
    ferro-nickel powders, coercive force 8839
Sky brightness see also *Night sky*; *Twilight*
    photometry 4917
    special scattering regions 4949
    20,000 and 40,000 ft. invest. 6643
    18,000 ft to 38,000 ft invest. 7419
    blue sky polarization in zenith 8383
    determination near sun 9848
Slide rules
    for nuclear emulsion calc. 2280
    for X-ray structure factor calc. 3920
    for lighting calc. 4222
    circular, for isotope sp. activity calc. 4629
    spherical triangle solutions 8425
    film, using Renard series 8426
    colour photography calculations 9908
Slip
    multiplication processes 673
    prismatic dislocations 737
    prismatic punching, limited occurrence 738
    rupture mechanisms in metals 1366
    plastic deformation theory 1369
    metals, deformation 1374
    dislocation generation of vacancies 1480–1
    widths of dislocations 3091
    resolved shear stress, crystals 3092
    rotational, in crystals by abrasion 3190
    lattice transformation rel. to plastic gliding 4796–7
    equilib. of linear arrays of dislocations 5827
    replacement by cell mechanism and boundary microflow 5839
    "rotational," of crystals 5902
    Lüders deformation characteristics, steel 6510, 9749
    real crystals, dislocations 6564
    alpha-brass, slip lines branching 7320
    yield phenomenon and twinning, α–Fe 7321
    strain rate effect on Al single-cryst. bands 9029
    metals, dislocation theory 9748
    steel, grain boundary theory 9750
    deformation of hexag. metals 9752
Smokes see *Aerosols*
Snow
    crystals, change meas. 1068
    evaporation from surface 1541
    radioactivity 2216
    radioactive snow gauge 4915
    growth of flakes 4943
    formation in clouds, review 7417
Sodium
    molten, compressibility temp. coeff. 105
    self-diffusion coeff. in NaCl and NaBr 658
    evap. layers, photo-elect. emission 4389
    photo ionization cross-section 8144
    eq. of state 8707
Sodium bromate
    elastic and piezoelectric coeffs. det. 5174
Sodium bromide
    magneto-optic constants 8862
Sodium chlorate
    elastic constants 3089, 9132
    elastic and piezoelectric coeffs. det. 5174
    photoelastic const. 6153
Sodium chloride see also *Rock salt*
    crystals, α-particle-released electron currents 1126
    monocrystals, luminescence under thermal treatment 1748
    thermal conductivity 2599
    solid, Na^+ diffusion coeff. 3062
    diffusion of solution 5159
    artif. cleavage faces 5906
    diel. const. of solution 6195
    P and S diffusion in 6490, 8241
    phosphorescence decay study 6883
    conductivity and transf. number in methanol 7345–6
    lattice imperfection diss. energies, calc. 7380
    use in powder annealing 7440

Sodium chloride—*contd.*
γ-ray induced phosphorescence 7775
elastic props. 8258
crystallization, anomalous radioact. trace co-cryst. 9126–7
soln., diel. props., u.h.f. 9444
Sodium iodide
Tl-activated, in γ-ray meas. 2020–1
Sodium niobate
ferroelectric properties 5394
Sodium silicate
solutions, light-scattering invest. 7353
Sodium vanadate
ferroelectric behaviour 8715
Soil
consolidation with time 3066
water movt. due to compaction 3962
Solar system see also *Planets, etc.*
origin theories 1578, 3272, 5014
properties of clouds from which formed 2318
origin, theories, review 7458
evolution of protoplanets 9235
planets position in, correl. with ionospheric disturbances 9863
Solid solutions see also *Alloys*; *Phase equilibrium*
CaS, SrS, phosphorescence mechanism 215
MnF_2, ZnF_2, paramagnetic susceptibilities 495
C diffusion in α-iron 656
$PbCl_2$ in AgCl, diffusion 657
Al–Zn, grain boundaries in melting 1351
$AuCu_3$ order-disorder, electron diff. study 1518
germination processes 2073
interstitial atoms diffusion in b.c.c. lattices 2082
H_2O_2–H_2O 2176
binary, configurational partition functions 3056
order formation in $CdMg_3$ 3068
Al, elastic const., rel. to electron conc. 3088
lower critical solution temp. theory 3154
Cu–Zn, X-ray diffraction 3210
cohesion of alloys, theory 3677–8
long-range order in β-brass and $AuCu_3$ 3910
order-disorder in ordering alloy system 3911
Alnico 5 precipitation and domain structure 4527
A.E.C. solid-state metall. 4770
alkali halides, lattice const. calc. 4771
short-range order, Ag–Au 4784
binary, configurational contrib. to heat capac. 5627
KCl–KBr, heat of formation theory 5633–7
ternary amalgams., thermodynamic invest. 5811
β–AgZn, long-range order 5922
diamagnetic metals in Pd 6312
superlattice $CuAu_3$ 6485
KCl–KBr crystals, ageing 6568
mixed crystals i.r. and Raman spectra interpretation 6857
anelastic effects from precip. in Al–Zn alloys 7323
diffusion coeffs. anelastic meas. 8242
radioact. tracers invest. 8243
Al–Zn system, α, α' phases theory 8406
wave propag. in 1-dimensional structures 8871
Fe in Cu, solubility 9014
order–disorder in body-centred cubic alloys 9015
order in Ni_3Mn 9019
2 CaO . (Fe, Al)$_2$O$_3$ system 9153
Te–Se alloys study 9739
ferro-electric 9443
intermetallic diffusion expts., reinterpretation 9740
HgSe/Se, elec. props. 9468
KCl and KBr mutual solid solubilities 3109
Solids
structure see also *Crystal structure*; *Examination of materials*; *Granular structure*; *Vitreous state*; *X-ray crystallography*
lattice emission spectra 222
crazing of linear high polymers 653
metals, crystalline interaction and hardness 664
metal single crystal surface structure 746
order-disorder for Coulomb forces 1211
deformation textures in metals 1373, 9030, 9752
conditions for surface states 1406
surface layer adsorption 1409
metals, structure, rel. to catalytic action 1420–1
electronic factor in heterogeneous catalysis 1422
Solids—*contd.*
structure—*contd.*
Piobert lines deformation effect on Fe 1486
Fe–Ni alloys, superlattice formation and mag. props. 1927–8
electron freeing in compact metal 1957
solid solns., germination processes 2074
Na_2O–SiO_2 glasses 2076
crystal boundaries in metals 2077
interstitial atoms diffusion in b.c.c. lattices 2082
polyethylene crystallinity temp. rel. 2186
polymers and methylmethacrylate optical anisotropy 2591
Schottky-effect deviations in Ta, invest. 2776
spheroidization of metallic particles 3058
order formation in $CdMg_3$ 3068
irreg. solids, temperature stresses 3069
polarized light exam. of metals 3465, 4302–3
hard metals, bond structure 3680
Mg low-temp. resist. min. 4376
trapping centres aggregation in semiconductors 4383
Alnico 5, precipitation and domain struct. 4527
orthogonal atomic orbitals 4585
alkali halide solid solns., latt. const. 4771
thoron diffusion through gelatin 4772
Cu interfacial free energy 4776–7
evap. Au, lattice distortion spectrum 4783
C black, adsorption invest. 4863
microcrystal formation on Po-alpha-irradiated crystalline surfaces 4985
order parameters 4898
lamination detection equip. 5209
dyestuffs luminescence in solid soln. 5295
lead titanate, anomalous sp. ht. 5368
Ba–Sr titanates, press. effect on diel. props. 5390
oxide-coated cathode activation 5509
press.-vol./press.-compressibility rel., metals 4573
electrodeposited metals 5810, 6664
disordered binary alloys, diffuse X-ray scattering 5819
KCl and KBr, irradiated crystals, u.v. absorption bands 5871
liq. metals, surface tension 6064
rock salt *K* absorption band studies 6134
WO_3 domain struct., stress effect 6201
electric fluctuation levels, metals after tempering 6207
dielectric dispersion, polycryst. matls. 6204
change at melting pt. 6226
superstructure transition, energy change kinetics 6354
superlattice $CuAu_3$ 6485
high polymers, cryst. and amorphous states dualism 7300
graphite bisulphate electronic structure 7301
coloured addition compds. 7795
intermetallic compds., elec. resist. 7849
metals, internal size-effect 7850
internal barriers in semiconductors 7876
Cr_2O_3 and antiferromagnetism 8025
polymers, crystallinity calc. 8238
the amorphous state 8239
ellipsoidal inclusion, elastic energy 8256
calcite, external frequencies and sp. ht. 8704
Fe–N, interstitial alloy formation 8407–8
wave propag. in 1-dimensional structures 8871
diffusion anisotropy, metal grain boundaries 9012
superlattice formation in b.c.c. alloys 9015
order in Ni_3Mn 9019
Li_2SO_4 . H_2O, nucl. mag. reson. study 9634
rubber reinforcement by C black 9754
study by exchange of sorbed H_2O 9759
LiH, state of ionization 9833
theory see also *Crystals*; *Dielectrics, theory*
thermal vibrations lattice perturbation det. 1212
dislocations theory 1364
superconducting electrons, wave functions 1846
intermetallic compds., electron transfer 1958
ionic crystals cohesive energy calc. 1959
alkali metals self-diffusion mechanism 2080
"artificial matter" for e.m. waves 2661
ternary Al-rich alloys, intermetallic compds. 2267
metallic Li, cohesive energy 2880
Hildebrand's thermal pressures approximation 2881

Solids—*contd.*
  theory—*contd.*
    configurational partition functions and long-range order 3056
    surface tension, crystall. surface 3057
    ionic lattices equations of motion 3503
    calcite elec. props., rel. to temp. luminescence 3515
    lattice-defect theory, semiconductors 3518
    intrinsic crystalline structure 3676
    cohesion of alloys 3677–8
    quantum mech. calc. of LiF crystal 3681
    solid-state luminescence theory 4293
    excitor-enhanced photoelec. emission, mech. 4391–2
    lattice vibration rel. to superconductivity 4396
    surface states theory 4569
    freq. spectra from sp. ht. data 4572
    mix-crystals vibration spectrum interpret. 4574
    transition metals, *d* shells interactions 4616
    non-linear elast. 4798
    superlattice and intermetallic compd. theory 4897
    co-operative phenomena 5134
    hole theory and heat of fusion 5370
    entropy of crystalline benzene calc. 5375
    valence intermetallic compds., i.r. photoconductivity 5414
    magnetic effects and Harker–Fock eq. 5561
    electronic energy bands, crystals, temp. effect 5626
    binary solid solns. heat capacity 5627
    surface energy of free-electron metal 5628
    Li correlation energy 5629–30
    cubic lattices partition functions 5631
    metals atom vibrations, rel. to heat of fusion 5632
    solid solutions, heat of formation 5633–7
    ultasonics propag. in ferromagnetics 6081
    rare-earth ions term splitting in crystal field 6122–3
    crystals, non-ideal electron-gas excitations 6210
    close-packed, triple-dipole interaction 6373
    β-brass relaxation theory 6493–4
    Zn phosphors luminescence mech. 6879
    diamond counter space charge 7032
    cohesive energy, ferromagnetism and paramagnetism, transition metals 7069
    linear chain of similar atoms 7143
    cooperative phenomena, theory 7144
    crystalline state 7383
    metals, non-equilib. no. of vacancies 7384
    thermal conductivities, low temp. 7802–3
    semiconductor theory 7856
    θ values in metals resist. 7902
    interaction of lattice vibrations with electrons 7907
    electronic energy temp. effect theory, crystals 8083
    overlap forces, body-centred cubic metals 8084
    internal friction, conf. 8279
    phys. chem. textbook 8280
    ionic crystals, lattice theory 8342
    "liquostriction" by wetting 8560
    antiferromagnetic structure and binding energy 8869
    wave propag. in 1-dimensional structures 8871
    electron theory, review 8872
    friction phenomena 9037
    surface tension of metals 9308
    light absorption due to 2 valency states interaction 9370
    Fe(OH)$_2$ colour change on oxidation 9371
    Na_xWO_3 metallic props. 9463
    impurity centres in Si 9475
    cryst. struct. and superconductivity 9492
    electron theory of crystals 9625
    alkali metals light absorption 9626
Sols see also *Colloids*; *Sedimentation*
    colloidal S and ice, acoustic irradiation effect 1436
    hydrophobic, critical zeta-potential 1444
    aqueous, particle shape invest. 2141
    colloidal silicic acid, low temp. studies 4858
    Ni(OH)$_2$, electron microscope exam. 5876
    orientation in dried films Al_2O_3 9741
Solubility see also *Phase equilibrium*
    air in lubricating oils and fuels 870
    paraffin solvent powers, irregularity 877
    phenanthrene in compressed gases 1656
    critical temp. region meas. 1799
    I in solvent mixtures 2429
    Hg in liquid P 7603
    Ni in phosphoric acid 9113
Solution energy see *Heat of solution*
Solutions see also *Heat of solution*; *Liquids*; *Solid solutions*
    concn. dependence of viscosity 108
    alkali halides, molecular properties 116
    organic, ultrasonic velocity 117
    binary organic, thermodiffusion 120
    non-isothermal systems, thermodynamics 121
    unsteady-state diffusion 125
    scintillations 212
    irradiated, fluorescence 224
    anisotropic ions or molecules, light diffusion 239
    entropies of mixing 282
    H_2, DH, D_2 ideal laws test 878
    ion solution in liquid mixtures 1426
    long-chain molecules, hydrodynamics 1437
    sorption columns theory, equilib. conditions 1447
    ditto, non-equilibrium conditions 1448
    macromol. diffusion constant rel. to conc. 1650
    shellac, optical properties 1775
    high polymers, anomalies rel. to mol. wt. discrepancies 1776
    1–1 electrolytes, compn. rel. to crit. temp. 1800
    ionic, osmotic press. theory 2424
    "conformal," statist. thermodynamics 2427
    liquid-gas, bubble stability 2428, 4158
    solvation, ultrasonic meas. 2431
    effect of solvent on Raman spectra 2566
    organic substances, light scattering 2590
    surface tension, stationary-waves method 3165
    polymethacrylic esters disintegration 3174
    heterogeneous polymers precipitation threshold 3175
    organic, ultrasonic vel. and compressibilities 3409
    rod-like macromolecules, visco-elastic props. 4137
    high polymers, theory 4155, 5161
    Na–liq. NH_3, nuclear spin relaxation studies 4156
    high polymer, dumbbell model 4157
    gas bubbles 4159
    fluorescence, energy transport study 4301
    light scattering invest. 4313
    K in liquid NH_3, paramag. resonance absorption 4530
    high polymer, osmotic pressures 4871
    ditto, viscosity/mol. wt. rel. 4872–3
    ditto, viscosity/conc. rel. 4874
    diffusion meas. 5159
    gas in liquid, rate rel. to viscosity 5162
    macromol., viscosity rel. to conc. 5163
    anisotropic, rodlike particles, scattering 5332
    strong electrolytes, light scattering 5333
    water exchange between cation and solvent 5849
    high polymer, second osmotic coeff. 6067–8
    statist. mech. theory 6071
    large molecules, progress review 6655
    Na silicate light-scattering invest. 7353
    salt dissolution, liq. currents diffusion 7601
    polymer, diffusion coeff. rel. to conc. 7602
    conc., of electrolytes, structure 7772
    water solubilization in non-polar solvents 8563
    entropy of aqueous solutes 8566
    theory, simple cubic lattice analysis 8836
    aq., 6 : 1 valency type electrolyte, conductivity 9059
    Na thymonucleate viscosity, rel. to conc. 9294
    effect of electrolysis on ultrasonic velocity 9316
    inf. dilute, theory 9320
    electrolytes, phys. props. 25°c to − 73°c 9321
    "conformal" theory, CO_2–ethylene appl. 9322
    gas, behaviour near critical point 9424
    bimolecular reactions mechanism 9765
    electrolytic, H ion extraction 9768
Sound see *Acoustics*
Sound ranging
    volume magnetostriction ultrasonics generation 5201
Sound recording
    disk-recording materials 169
    magnetic, ferromagnetic hysteresis appl. 1187, 9606
    magnetic, nuclear magnetic signals integration 1237
    visible speech records 1697
    reversed speech and repetition systems 1700
    in language engineering 2479
    sonograph and sound machines 2486
    turntable speeds, rel. to distortion 7648

Sound reproduction see also *Acoustic radiators, transducers*; *Sound recording*
- visible speech records 1697
- pattern playback for speech perception 7645
- turntable speeds, rel. to distortion 7648

Space charge
- in Joshi effect 340, 4404
- Joshi effect explanation 341
- layers, in l.p. Hg arc control 343
- glow disch. electron conc., microwave meas. 351
- flow stability of electron beams 363
- electron beam, effects, reduction by ion trapping 369
- near gaseous diode cathode, +ve-ion neutr. 383
- screening effect in ion recombination 404
- plasma formation in spark breakdown 1857
- congruent space charge flow 2730
- double layers in l.p. gas discharges 3548
- space-charge and transit-time noise reduction 3567
- electron optical exploration in cut-off magnetron 3568
- cylindrical magnetron, synchron. conditions 4480
- macroscopic, in KCl soln. electrolysis 5864
- in dielectric, theory 6194
- in double diodes 6286
- control of Cu overvoltage 6537
- effects in h.f.-modulated beams 7012
- in diamond counters 7032
- layer, semiconductor surface phenomena theory 7859
- effects in AgCl conduction 7864
- electron density near electrode, l.p. discharge 7912
- electron density in ionized gases, meas. 7913
- distribution, effect on discharge mechanism 7923
- magnetron in cut-off static regime 7979
- diode, relativistic correction 8804
- Joshi effect in I vap. under X-rays 9509
- magnetron cathodes factors affecting enhanced emission 9566
- in electrolytes during electrolysis 9769–70

Sparks, electric see also *Breakdown*; *Lightning*
- discharge in magnetic fields 335
- cold electron emission 342, 8749
- heavy current, light emission 353–4
- pre-discharge displacement current 1069
- compressed gases, + ve point-to-plane 1082
- ionization in porous insulators 1142
- "sliding" as light source for far u.v. 1718
- plasma formation, oscill. study 1857
- cut-cable, as light source 1859
- discharges in gases, review 2710
- high-current channels, voltage gradients 2715
- air breakdown, formative time lags 2716
- spark counter characteristics 2768
- h.f., cloud chamber study 3537
- impulse, photographic study 3538
- as spectrochem. light source 4326
- initiation, in gases, electrodes role 4425
- condensed, spectroscopic study 6101
- uncondensed, spectroscopic study 6102
- effect of cathode oxide layer 6235
- excitation temperature 6836
- channel development theory 6985
- oscillographic invest. 6986
- channel, exptl. invest. 6987
- Paschen's law failure, h.p. mech., 6997
- surface, Lichtenberg figures 6998
- recombinations effects in electron avalanches 7917
- review of gap charac. 7918
- effect on metal surfaces, X-ray invest. 8249
- in H, afterglows 8748
- mechanism of + ve discharges in air 9505
- gas breakdown at 2 800 Mc/s 9508

Specific heat see also *Calorimetry*; *Heat capacity*; *Thermodynamic properties*
- ratio in wind-tunnel and jet-engine gases 252
- salts of Fe group elements 272
- γ for He, rel. to press. 902
- gases, ratio near abs. zero and Nernst theorem 1029
- nuclear, of paramagnetic salts 1183–4
- Ba–Sr titanate ceramics 1797
- superconductors, theoretical and experimental, deviations 1852
- potassium chromic alum, low temp. 1933

Specific heat—*contd.*
- iron ammonium alum, rel. to microwave spectra 2531
- and conductivity and diffusivity, det., insulators 2597
- Ni amalgams, irreversible transition 2612
- ferromag. Cr_2S_3 2641
- anomalous, and molec. rotation, solid alcohols 2642
- CO_2, const. vol., near critical point 2643
- adsorbed water in swollen cellulose 3153
- metals, dynamic method 4349
- AgBr, high-temp. 4350
- amorphous state 4351
- γ by self-sustained oscillations 4352
- magnetite 4526
- freq. spectra simple solids 4572
- rel. to cohesion in polymers 4875
- liquid He 5364, 9427*
- lead titanate, anomalous 5368
- liquid Hg 0–450°c 5369
- Ba–Pb titanates 5395
- Ni, theory 5555
- rel. to temp., Fe–Al–Si alloys 5567
- Co ammonium sulphate, 1°K 5582
- vibrational, theory appl. to cubic lattices 5631
- polycryst. AgBr, rel, to lattice defects 5908
- benzene vapour, ultrasonic 6078
- Zn, Ni and Co ferrites 6182
- Se 6208
- anomalous, alloys, relaxation effects 6493–4
- solid hexadecane and octadecane, transition points study 6921
- non-metallic materials meas. 6933
- Ge, anomaly explanation 7862
- argon, 0–2 000 atmos. 0–150°c 8574
- calcite, as function of temp. 8704
- vanadium sesquioxide 8705
- metals, low temp., superconductivity theory 9494
- nuclear, v. low temp. 9602
- Cs Ti alum, low temp. 9603

Spectra see also *Absorption*; *Astronomical spectra*; *Aurora*; *Colour*; *Luminescence spectra*; *Mass spectra*; *Night sky; Raman spectra*; *Spectrochemical analysis*; *Spectroscopy; Stark effect*; *Zeeman effect*
- from high-current spark discharges 353–4
- fine-structure constant rel. to other const. 559
- I.r., low temps. effect 1716
- gaseous discharge 2709
- temp. and press. effect on crystal term values 4246
- line emission, inhomogeneous layer 5240
- oxide cathode in gaseous discharge 5511
- geom. representation of line series 6835
- absorption and emission of r.f. waves, quantum theory discussion 7111
- perturbations in band spectra 7672
- rotational and vibrational structure, gas and liquid 8629
- lightning flashes 9858–9
- **continuous**
  - d.c. arc, influence of A, He, O and CO_2 1717
  - He afterglows, electron removal 1865
  - K continuous absorption 2931
  - Hg 6107
  - absorption, electronic lines, localization by temp.-effect 7698
  - methane and related molec., theory 8630
- **flames**
  - burning C 940
  - fluorine supported 941
  - OH radicals, transition probabilities 1392, 4825
  - hydrocarbon, kinetic mechanisms 1723
  - abnormal electronic excitation 2619
  - OH-radical kinetics 3116
  - review article 3492
  - hydrocarbon, isotope effect 4242, 5258
  - HCO, C_2 and CH bands, excitation 5254
  - oxy-acetylene, OH vibration-rotation bands 5263
  - temp. det. from u.v. OH band emission 5356
  - systems containing O as NO_2 6108
  - NH free radical studies 6846
  - 1st stage engine combustion 6927
  - OH predissociation 7671
  - oxy-hydrogen, invest. 8287

Spectra—*contd.*
- **resonance** see also *Luminescence spectra*
  - Hg, quenching, paraffin hydrocarbons cross-sections 2510
  - Cu I, isotope shift 2513
  - 6^3P_1 mean life for Hg isotopes 2515
  - monosubstituted benzenes 2883
  - Na, K, Rb, Cs vapours selective reflection 7757
  - resonance radiation imprisonment, gases 9387
- **X-ray** see *X-ray spectra*
- **atoms** see also *Atoms, excitation, structure*
  - odd-even isotope shift staggering 545
  - multiplet separation factors calc. 552–3, 1248
  - ionization potential estimation 1251
  - nuclei mag. and electrical properties influence 1253
  - *g*-value changes with mag. field 1721
  - inverted alkali doublets 2507
  - canal-ray polarization calc. 4457
  - h.f.s. study of nuclear mag. moment 4611
  - isotope shifts, electron-neutron interaction effect 5104
  - fundamental research review, and table 5255
  - alkali terms doublet splitting 6841
  - r.f., historical survey 6851
  - oscillator strengths calc. 7192
  - data for astrophys. survey 7675
  - nuclear effects, review 7677
  - A, high press. 5253
  - Ag isotope shift 4597
  - Al I new u.v. lines excitation 7674
  - Al, in air and H_2, comparison 9366
  - As I 2509
  - Ba isotope shift 183
  - Bi^{209} mag. moment calc. 1978
  - Br spark hyperfine structure 3431
  - Br arc hyperfine structure 3704
  - C, isotope shift 1725, 6109
  - Co h.f.s. in paramag. resonance 7101
  - Cr II deep configurations 2508
  - Cr absolute oscillator strengths 7191
  - Cu^{++} h.f.s., ang. dependence 2512
  - Cu III 6842
  - D hyperfine struct. 1255
  - D fine structure 3708
  - D α-line fine struct. 7680
  - Fe III multiplets, spin interaction 5673
  - Gd, arc and spark 944
  - Gd I isotope shift 7678
  - H fine structure 554, 3708
  - H hyperfine structure 1255
  - H Paschen and Brackett line profiles 2337
  - H 35 term shift det. 2514
  - H, Lamb shift, Bethe approx. 3709
  - H, $2S_{\frac{1}{2}}$ to $1S_{\frac{1}{2}}$, electric fields effect 3710
  - H discharges, forbidden lines 4243
  - Hβ line Stark effect 5256
  - H, Lamb–Retherford effect 5267
  - Balmer line width in H arc 6247
  - H, f.s. and h.f.s. nuclear motion effect 3706, 7189, 8138*
  - H, recent discoveries, review 7676
  - H anomalous fine struct. 7682
  - excited H, 3 cm microwaves 8071
  - H^- doubly excited state 8139
  - He intercombination lines 2506
  - He discharges, forbidden lines 4243
  - He^3 5251
  - He afterglow, recombination effect 5252
  - He, singly ionized, anomalous h.f.s. 7682
  - Hg 2537 Å line, reflection factors 182
  - Hg arc, excitation energies det. 943
  - Hg^{198}, length standard 1720
  - Hg, u.v. absorption in soln. 4264
  - Hg III hyperfine structure 2511, 7681
  - Hg, radiation re-absorption h.p. discharge 7683
  - In arc spectrum 6129
  - $Ir^{191, 193}$, hyperfine structure 1244
  - N I in aurora 2223
  - N isotope shifts 6109
  - Na *D*-lines perturbation by press. 6105
  - $Nd^{143, 145}$ hyperfine structure 7186
  - Ne V ^1D–^3P lines, multiplet intensities 9369
  - Ne ionized, line strengths 9644

Spectra—*contd.*
- **atoms**—*contd.*
  - Ni absolute oscillator strengths 7191
  - O, forbidden transitions 1137
  - O I in aurora 2223
  - O III ^1D–^3P lines, multiplet intensities 9369
  - Pb, isotope effect, regularities 1971
  - Pm 5249
  - positronium, fine structure, calc. 8112
  - S^{33}, microwave mag. moment 2923
  - Sm isotope shifts 3434
  - $Sm^{147, 149}$ hyperfine structure 7186
  - Sn vapour in Schumann region 207
  - Sn, in He and H_2, u.v. 6876
  - Ta I 3430, 5250
  - Ta, doubly ionized 7669
  - Tc^{99} h.f.s. 3695
  - Tc, arc and spark 5248
  - Tc in sun 9241
  - Tc multiplets and terms 9368
  - Th III, analysis 180–1
  - U spark, analysis 942
  - V I deep configurations 2508
  - Xe 1469 Å-line perturbation by A 3433
- **inorganic molecules** see also *Molecules, excitation, internal mechanics*
  - identification; tables and descriptions 186
  - effect of quadrupole moments 1253
- **inorganic molecules, diatomic**
  - theory and techniques, textbook 2502
  - i.r. bands theory 2895
  - fundamental research, review 5260
  - i.r. absorption, perturbations 6853
  - rotational constants from perturbation data 7673
  - i.r. absorption, powder method study 7729
  - vibrational transition probabilities calc. 8096
  - AlBr 3436
  - AlCl 3435
  - AlH band systems 184
  - BS 2517, 8625
  - BaO, perturbations 188, 1726, 2516
  - Br vap., visible absorpt. band studies 6125, 7691
  - BiCl, new absorption band system 7742
  - BrF, emission 6845
  - BiS u.v. absorption 7719
  - C_2 transition probabilities 185
  - C_2 Swan bands, critical press. effect 2551
  - C_2, oscillator strengths 2893
  - C_2 bands in Kr 5257
  - C_2 Swan bands transition probabilities 6111
  - C_2, new u.v. band system 6115
  - CF bands 6112
  - CO first overtone intens. meas. 6874
  - CO quant. i.r. meas. 6873
  - CO fundamental, integrated absorption 7690
  - CO effective av. absorpt. coeff. 9382
  - CaO i.r. band-system 3437
  - Cd_2 λ2212 band 5259
  - ClF, infrared 8645
  - CrI, rel. *f* values 5268
  - Cs^{133} Cl^{35} r.f. spectrum 8642
  - GaF u.v. absorpt. 9376
  - GaH u.v. absorption 6129
  - H_2, l.v. absorption, foreign-gas-induced 2538
  - HCl, far i.r. 190
  - HD, rotation-vibration 204
  - HF, u.v., absorption 1731, 5288
  - HF i.r. absorption 9374
  - $(He^3)_2$ 947
  - He_2, in a.c. glow 8623
  - HgH, HgD, wrongly ascribed to CH^+ 6843
  - HgIn band spectrum 2519
  - I_2 excited in presence of A 4265
  - I vap., visible absorpt. band studies 6125, 7692
  - IF, emission 6845
  - InF u.v. absorption 9376
  - InH u.v. absorption 6129
  - N_2^+ transition probabilities 185, 5261
  - N_2, i.r. absorption 198, 954
  - N_2^+, new bands in aurora i.r. 2232
  - N_2, $C^3\pi n$ state excitation 2520
  - N_2, oscillator strengths 2893
  - N_2, active, i.r. 4245

A complete list of the Subject Headings will be found at the end of the Index.

Spectra—*contd.*
inorganic molecules, diatomic—*contd.*
N_2^+ first negative band system 5262
N_2 excitation in Na arc 6106
N_2 first positive band transition probabilities 6113
N_2 dissociation and predissociation 8624
NH free radical studies 6846
NO, u.v., absorption 200, 6877
NO, emission band 6000 Å 946
NO, Zeeman levels hyperfine structure 1724
condensed NO, i.r. 4263
NO, liq. and gaseous 8639
NS γ-band analysis 7684
Na_2 u.v. bands 6130
NaLi existence invest. 4266
O_2, i.r. absorption 198, 954
O_2 auroral afterglow, quadrupole transitions 537
O_2 bands in night sky i.r. 2225
O_2 forbidden lines by molec. dissoc. 6114
OH, i.r. night-sky emission 3992
OH, new vibration-rotation band 8385
P_2 u.v. band system 1727
P_2, u.v. bands, perturbations 1728
S_2 band-spectrum, perturbations 187
SiCl, new bands 7743
SiF u.v. band system 2521
T_2, $3p\,^3\Sigma \rightarrow 2s\,^3\Sigma$, bands 6844
TH, $3p\,^3\Sigma \rightarrow 2s\,^3\Sigma$, bands 6844
TiO γ-system, rotational analysis 7685
Tl halides, absorption 3443
ZnBr band spectrum 945
ZnO, absorption 8650
ZrO band-spectrum 189
radiowave
gases and liquids, review 199
historical survey 6851
BrCl 958
D_2 in mag. field 1740, 5672
D_2, new molec. beam resonance method 8105
H_2 in magnetic field 203, 5672
H_2, new molec. beam resonance method 8105
$K^{39}F$, electric resonance method 195
O_2 fine structure 202
O_2, magnetic-resonance 2534
O^{18} spin invest. 5282
O_2 resonance absorption at 2·5 mm 9384
inorganic molecules, polyatomic
fundamental research, review 5260
excited triplet states 6119
XYZ_3 rotational hyperfine structure 6377
i.r. absorption, perturbations 6853
method for vibrations det. 7145
isotopic molecules frequency rel. 8628
AsH_3 vibration potential function 1213
AsH_3, l.f. fundamental bands 7747
BCl_3, i.r. 4280
CO_2 2·7 μ bands 959
CO_2, i.r. 5283
C^{13}/C^{12} ratio meas., infra-red 7754
CS_2 i.r. absorption intensities 7694
Cl_2O, ClO_2, i.r. 5285
D_2O 2 787, 5 373cm^{-1} bands 9633
$Eu(BrO_3)_3 . 9H_2O$ 4255
$EuCl_3 . 6H_2O$ 4254
F_2CO 774 cm^{-1} absorption band 4272
F_2O, i.r., new meas. 4251
Fe tetracarbonyl 5277
GeH_3Cl^{35} h.f.s. 5661
H_2O atmospheric, near i.r. 3445
H_2O, infra-red 5283
H_2S, i.r., vibrational energy calc. 1744
H_2S band at 1 180 cm^{-1} 4277
H_2S band at 1 183 cm^{-1} 6871
H_2S rotation line intensity 8643
H_2S, infrared 8644
HNCS, i.r. 2537, 2906
HNCO, i.r. 7748
MoF_6 u.v. absorption 5287
N_3H vapour decomp. products 4828
NH_3, far i.r. 190
NH_3, i.r. bands 205
NH_3 vibration potential function 1213
NH_3 and ND_3, electron impact 2518

Spectra—*contd.*
inorganic molecules, polyatomic—*contd.*
NH_3 and ND_3, vibrational 6382
NH_4NO_3, i.r. 196–7
$N^{15}N^{14}O^{16}$ and $N^{14}N^{15}O^{16}$, infrared 2540
N_2O below 1·2 μ 2548
N_2O atmospheric band 3994
N_2O i.r. absorption intensity 7751
N_2O i.r., vibration-rotation invest. 7750
N_2O, rotational isomerism invest. 8638
N_2O, i.r., for quant. gas analysis 9386
NOBr, i.r. 2541
NOCl, i.r. 2541
OCS infrared absorption intensities 7694, 7753
OH-band system excitation in fluorescence 6884
P_4, vibrational 4260
$Pb(NO_3)_2$, i.r. at − 160° and 25°c 197
S_8, vibrational 4260
S_2Cl_2, vibrational 4260
SF_6 absorption, vac. u.v. 4284
SF_6, i.r. 5286
SH-band system fluorescence excitation 6884
sulphur monoxide, probably S_2O_2 201
$(SO_4^-)n$, i.r. absorpt. study 7714
SbH_3, i.r. 4279
SiF_4, i.r. 4283
$TlNO_3(\gamma)$, i.r. 196–7
WF_6, u.v. absorption 5287
radiowave
gases and liquids, review 199
Cm-wave Faraday effect 951
pressure broadening theory 6850
historical survey 6851
alums, absorption 7702
AsH_2D 4269
Ge mass, microwave study 4622
GeF_3Cl 4270
I homopolar compds., quadrupole frequencies 952
NH_3 inversion line press. broadening 2904, 9383
NH_3, empirical formula 5280
NH_3 lines freq. stabilization appl. 6852
NH_3 inversion, Stark effect 6869
NH_3, broadening by O_2, He, N_2O 8640
deutero–ammonias 4267–8, 7746
analysis of NH_3/D_2 exchange 9047
$(NH_4)_2SO_4$, absorption 7702
NOCl 6870
NO_2, microwave 6866
Ni^{++} ground state splitting in Ni fluosilicate 7190
PH_2D 4269
S^{35} mass from OCS spectra 5677
S, Si mass, microwave study 4622
SCSe 950
SO_2 4247, 6868
SbH_2D 4269
inorganic liquids and solutions
U III and U IV salts, i.r., rel. to Pm 953
$Nd(NO_3)_3$ in binary solvents, absorption 2530
diluted iron ammonium alum, microwave 2531
H_2O, near-i.r. absorption 5274
$CoCl_2$, effects of chlorides 6864
Eu salts, Nd salts, Zeeman effect studies 7739
liquid NO 8639
inorganic solids
PbS, PbSe, PbTe layers, absorption 192
KCl, coloured, absorption 194
alkali halides, *F*-absorption bands 730
ditto, pure and coloured, absorption bands 6856
rocksalt crystals, discoloration invest. 734
ditto, *K*-band 6134
Cu_2O, absorption 1737
MgO, induced absorption bands 1746
quartz and corundum, u.v. absorption 2525
ice crystals, H-bond vibrations 2561
crystals, temp. and press. effect on term values 4246
NH_4 halides, absorption and reflection 4257
mix-crystals, vibration spectrum 4574
H_2S and D_2S, crystalline, vibrations 5269
KI, new u.v. absorption bands 5272
planar complexes, dichroism 5290–1
KCl and KBr, irradiated, u.v. absorption bands 5871
rare-earth ions term splitting, crystal field 6122–3
KHF_2, i.r. reflection 6124

Spectra—*contd.*
inorganic solids—*contd.*
NH_3, ND_3 films i.r. spectra 6382
mixed crystals, i.r., interpretation 6857
galena, infra-red 6858
crystals, low-temp., i.r. 7723
metallic salts polymerization det. by i.r. absorption 7731
chrome alum crystals, absorption 8634
ditto, α- and β-bands, oscillator strengths 8635
glasses, u.v. absorption 8637
Zn blende, i.r. 9375
powdered metal carbonates, i.r. 9377
organic molecules and substances see also *Molecules, internal mechanics*
Na peruranates, absorption 191
hydroquinone, resorcinol, catechol, near u.v. absorption 206
molecular orbital predictions 530–1
benzaldehyde blue spectrum 948
aromatic hydrocarbons, u.v. absorption 955
ethylene, u.v. 956, 964
unsat. hydrocarbons, Franck–Condon freq. 1217
naphthalene vibration spectrum 1222
linear polyenes, absorption 1223
straight-chain hydrocarbons and ethers, perturbations 1732
CH_1, CH_2 and CH_3 valency vibrations, harmonics 1734
solid dye films 1736
liquid benzene, 2 795–3 560 Å 1739
phenanthrene in compressed argon 1745
metallic oxymethylenecamphor complexes 1781
anthracene polarisation spectra 2523
space-group C_{2h}^5 crystals 2565
thiophenol 2884
$(C_6H_5)_2X$ type compds. 2885
phenyl halides 2886
styrene, phenylacetylene, phenylcyclopropane, phenylcycloalkanes 2887–8
cyclohexane, vibration freq. calc. 2894, 3439
formaldehyde, glow discharge 3444
anisole, u.v., absorption 3446
1 : 1-dichloroethylene u.v. absorption 3447
diacetylene vibration spectrum 3687
benzene and monoderivs., absorption, temp. effect 4259
cyanogen chloride, u.v. absorption 4285
benzaldehyde vapour, near u.v. 4286
isoconjugate, variconjugate sequences 4575
substituent groups, spectroscopic moment 4577
hydrocarbon flame bands, isotope effect 5258
ketene, far u.v. 5289
triborine triamine out-of-plane H vibrations 5647
benzene vapour glow discharge 6110
C=C bond valence-vibration line intensity, hydrocarbons 6120
quinhydrous-type molecules in soln. 6551
u.v. absorption, deviations from Beer's law 6861
fluoranthene, u.v. absorption 6862
diazines, u.v. 6865
methyl groups in Cd dimethyl 7166
substituted stilbenes 7361
glow discharge in napthalene vapour 7686
complex molec., energy transfer 7687
natural hypsochromic shifts 7696
benzene–oxalyl chloride, complex formation 7699
oxalyl chloride, u.v. 7716
naphthalene, transitions 7717
H-bridged molecules u.v., protein appl. 7718
polymethine molec. metallic model theory 7720
naphthalene absorption, low temp. 7721
proteins, polarized u.v. light 7733*
cata-condensed aromatics, solvent-induced shifts 7738
aneurin and cocarboxylase in soln., u.v. 7741
fluorinated toluenes, u.v. absorption 7755
subs. benzenes and naphthalenes, vac. u.v. 7756
symmetric molecules, anomalies 8085
complex molec. emission, electronic transitions 8103
simple aromatic hydrocarbons, low excited states 8104
methane, etc., continuous spectrum, theory 8630

Spectra—*contd.*
organic molecules and substances—*contd.*
quindoline u.v. absorpt., substituents effect 8633
alkyl nitrites 8638
amino-acids in proteins, u.v. 9379
paradibromobenzene electronic bands 9380
phenetole, absorption, near u.v. 9381
infra-red
epoxy structures 949
2,3-dibromo-2,3-dimethylbutane and 2,2,3,3-tetramethylbutane 957
chloroacetylene and deuterochloroacetylene 960
C_2N_2 and CClN absorption band intensities 961, 7752
acetylene 962, 4273
COClF 963
methylfluoroform, internal rotation barrier 1225
liq. sat. aliphatic hydrocarbons 1738
chlorofluoromethane 1741
nitrosyl chloride 1742, 8631
ethane, normal modes 1743
unsat. aromatic carbinols 2528
para-difluorobenzene 2529
nitrosyl fluoride 2536
propane and 2,2-dideuteropropane 2539
pyridine, multiplicity-forbidden bands 2542
C_2H_2, 4400–8500 cm^{-1} 2543
1,1,1-trifluoroethene 2544
cyclopentane, cyclopentane-d_1 and cyclopentane-d_{10} 2545
CH_3CF_3 2546, 6875
isocyanic acid 2547
1,2-dihalogenoethanes rotational isomer theory 2908
synthetic polypeptides 3172
CH_2BrCH_2Br and CD_2BrCD_2Br 3173
C=O vibration freq., rel. to Raman det. 3440
cellulose, effect of structure changes 3441
liquid benzene, absorption 3442
methyl cyanide, rotation-vibration 4249
methyl chloroform 4250
CH_2 vibrational freq. of *n*-paraffins 4252
vinylidene cyanide 4253
trimethylphosphine oxide 4258
tropolone 4261
trichloromethanes 4262
CD_3CCH, photographic 4274
$H_2C = CHD$ 4275
monochlorosilane, vibration-rotation 4276
CH_4 absorption band, foreign gases effect 4278
CH_2N_2 and CD_2N_2 4281
diborane and isotopic derivs. 4282
wavelengths for calibration 5246
fibrous proteins 5271
mesitylene complexes 5273
characteristic freq. of – COOH 5275
aneurine and cocarloxylase 5276
hydroxyl groups, band intensities 5278
condensed aromatic systems rel. to semiconductivity 5408
ethylene combination bands 6127
$H_2C = CD_2$ 6128
long CH_2 chain, polythene 6378
i.r. absorption, perturbations 6853
methyl- and dimethyl-hydrozine 6859
C–H vibrations, rel. fundamental and 1st harmonic 6860
characteristic bands, ketones and esters 6863
trioxane, C–H stretching modes 6872
organic thiophosphates 7703
Zn and Hg dimethyl, internal rotation 7704
hydroxylic compds. 7705
complex molecules, structure anal. 7706
ethylene polymers 7707
large molecules, interpretation problems 7708
absorption, methyl halides, $1\cdot6\mu$ 7709
D-containing propane derivs. 7710–11
I : 3 : 5-trifluorobenzene 7712
C and Si tetramethyl and monodeutero derivs. 7713
oxalyl chloride 7715
crystals, low-temp. 7723
metallic acetyl-acetonates 7724
polypeptides and proteins, chain folding evidence 7725

Spectra—*contd.*
organic molecules and substances—*contd.*
infra-red—*contd.*
n-paraffins, vibrational spectra interpretation 7726
polarized radiation, rubber appl. 7727
rubber derivatives 7728
globular protein structure 7730
chitin 7732
rotational isomerism studies 7734
substituted ethanes 7735
12 subst. benzene derivs., 15 to 40μ 7736
benzene ring compounds 7737
amino-acids, and their hydrochlorides, new band 7740
B–N compds. 7749
C_2H_2, absorption intensity 7753
O as carbonyl, from molar extinction coeffs. 8632
n-acetylglycine, diketopiperazine polarized i.r. 8636
CH abs. freq. and their perturbations 9372
acenaphthene and naphthalene differentiation 9373
bromochlorofluoromethane 9378
ketones 9632
radiowave
gases and liquids, review 199
CH_3Cl, CH_3Br, CH_3I, BrCN, ICN, centrifugal distortion constants 1735
CH_3Br 1964
methyl silane 2526
methyl acetylene 2527
nitrosyl chloride structure det. 2533
isothiocyanic acid 2905, 7173
trifluoromethyl acetylene 4271
methyl mercaptan 5279
collision diameters and quadrupole moments 5281
HOCl and DOCl 5284
OCS, HNCO, H_2CO, CHF_3 dipole moments 5649
C_2H_4O, C_2H_4S 6126
historical survey 6851
EtOH, $\lambda = 3{\cdot}24$ cm 6953
$H_2C^{12}O$ analysis 7154
trifluorosilane derivs. 7175
u.h.f., aliphatic ketones 7700
C_2D_2 vibration-rotation transitions 7745
methyl mercaptan 8641
Spectral line breadth see also *Doppler effect*; *Stark effect*; *Zeeman effect*
collision broadening, microwave 2535
NH_3 inversion lines pressure broadening 2904, 9383
pressure broadening theory 4244, 6850
O_2 microwave 4248
$K\alpha_1$, rel. to at. no. 5452*
Balmer, in H arc 6247
i.r. absorption, effect of slit width 8618
NH_3 microwave, pressure-broadening 8640
Spectrochemical analysis see also *Chemical analysis, positive rays*; *Spectroscopy*
survey of practice 176
Al cathode, H–D exchange process 1070
solutions, electrode with C as reference element 1469–70
gas isotopic content by cm absorption 1471
arc spectra, background variation errors 1472
arc, A, He, O and CO_2 effect 1717
Zr–Hf mixtures, quantitative 2152
2 wavelength ranges simultaneous recording 2153
heterochromous photometry method 2494
diatomic molecules, textbook 2502
Cr diffused in iron and steel 3064
background correction, densitometer scattered light effect 3183
integrating flame photometer 3423*
conference report 3892
annual review, bibliog. 3894–5
light sources, survey 4326
X-ray, with bent crystals 4411
step-sector film calibration 4886
air current betw. electrodes error 4887
echelon-type log. sector use 4888
spark spectra, suppression of parts 5241
alloys, effect of air press. 5242
Tc, arc and spark 5248
photoelec. spot anal. Sb and Bi 5899
metals, parameter var. accuracy effect 6553
Spectrochemical analysis—*contd.*
Be det., liquid-condensed-sparking method 6554
perchloric acid line intensities suppression 6555
halogens, S, in engine deposits 6556
spark, of semi-microsamples, mounting method 7366
cyanogen rarefaction with solid CO_2 7798
radioactive ionization appl. 8326
pyridine homologues electronic spectra appl. 8327
indirect spectrometry 8328
NH_3/D_2 exchange, by microwaves 9047
technical extinction meas., new instruments 9117
new generalized method 9119
B quantitative anal., soln. method 9120
Al arc spectra in air and H_2 9366
arc electrode separation in vacuo 9412
infl. of temp. of spectrometer 9800
spectrocomparator for mixtures analysis 9801
infra-red
annual review, bibliog. 3893
characteristic freq. of — COOH 5275
microspectroscopy 7667
monodeuterotoluenes 9118
atmospheric gases 9386
Spectrometers see also *Mass spectrometers*; *Monochromators*; *Spectrophotometers*; *Spectroscopy*; *X-ray spectrometers*
practical text-book 176
i.r., double-beam recording 178, 6103
l.v. microspectrometer 179
grating, for far i.r. 190
rocket-borne spectroheliograph 793
rapid scanning, i.r., oscillographic use 938
with Féry prism, for Schumann u.v. 939
double-beam i.r., fast-scan display 2503
fast spectrograph for h.f.s. studies 2927
grating, for photoelectric recording 4233
infrared, calibration 4239, 5247
ditto, LiF refractivity 9362
ditto, effect of change of angle of incidence 9365
10-channel, u.v. 4240
i.r., use for liq. refract. index meas. 5237
i.r., calibration, temp. coeffs. 5244
i.r. wavelengths for calibration 5246
analysis of resolution on communication theory 6100
influence of slit width on energy dist. 8617
i.r. absorption, effect of slit width 8618
concave grating for far u.v. 8619
accessories
slit illuminator for conversion to spectrophotometer 177
photomultipliers 936
automatic excitation and exposure control 1719
variable-thickness, low-temp., i.r. cell 1730
for simultaneous 2-wavelength range recording 2153
step-sector for astigmatic spectrograph 2504
apparatus for time-resolved spectroscopy 2505
controlled atmos. excitation chamber 4234
long slits, image transformation appl. 4235
low temp. Raman cryostat 4297
an f : 1·0 camera for astron. spect. 5008
photometer unit, i.r. 5232
photocell attachment for line intensity meas. 5243
u.v. absorption, low-temp. apparatus 5245
efficient grating mount, i.r. 5235
sq. wave generator, synchronizer 7665
spectrum plate comparator photoelectric setting 8622
fringes due to Soleil compensator 8659
spectrocomparator for mixtures analysis 9801
Spectrometers, microwave
Stark effect absorption cells 937
frequency meter 4237
review 5267
high-temp., broad-band Stark cell 6867
sq. wave generator, synchronizer 7665
Spectrophotometers see also *Colorimeters*
new type for solar corona 36
ratio-recording, double beam, i.r. 177
i.r., Tl bromoiodide cryst. filters 2075
infrared, 5 types 3429
double-beam, i.r., design and performance 4238
grating monochromator 6840
photoelectric, recent advances 7668

Spectrophotometers—*contd.*
- Beckmann, false absorption bands, 200–230 mμ 7689
- rapid, for reaction kinetics meas. 9053
- ditto, stopped flow attachment 9054
- ditto, double beam apparatus 9055

Spectrophotometry see also *Colorimetry*
- survey of practice 176
- macromolecule mol. wt. det. by scattering 709
- jet-engine exhaust gas temp. meas. 113
- visual, photometric separator 2493
- spectroscopic binary magnitude differences 3288
- infrared, principles 3429
- impulse discharges study 3538
- optimum optical density 4232
- plates pre-exposure criteria 4236
- near i.r. with Beckman DU spectrophotometer 4241
- He discharge forbidden lines invest. 4243
- crystals Raman spectra 5305
- solar spectrum invest. 5994
- sub-dwarf stars, study 6706
- blue sun (Sept. 1950) invest. 7418
- 3 metallic-line stars study 7483
- low intensity, fluorescent lamps, etc. 7656
- chromospheric eruptions 8460
- optimum transmittance 8620
- false absorption bands 200–230 mμ 7689
- of F stars and τ Ursae Majoris 6707

Spectroscopy see also *Spectra*; *Spectrometers*; *Spectrophotometry*
- experimental, text-book 176
- molecular spectra identification 186
- radiowave absorption, gases and liquids, review 199
- diffraction gratings and plane mirror 235
- bulk radiation imaging 935
- use of photomultipliers 936
- compressed gases as solvents, Schumann region 1745
- diatomic molecules, textbook 2502
- weak line observation 2506
- microwave, reviews 2532, 5267
- gaseous discharge statistical phenomena invest. 2709
- radiofrequency, conf. rep. 3428
- conference report 3892
- plates pre-exposure criteria 4236
- discharge tubes, forbidden lines study 4243
- spark, suppression of parts by time switching 5241
- alloys, quantitative, effect of air press. 5242
- i.r. wavelengths for calibration 5246
- HCO, C_2 and CH bands excitation, flame spectra 5254
- absorbing substances, by i.r. reflection 5270
- atomic and molecular, quantum theory appl. 5845
- analysis on basis of communication theory 6100
- condensed spark study 6101
- uncondensed sparks study 6102
- low-temp. i.r. absorption cells 6116
- infrared, recent advances review 6121
- Raman line brightness doubling 6161
- slit width rel. to energy distrib. 6837, 8617
- l.v. to u.v., elec. detect. and recording, review 6838
- static multislit, i.r. panoramic display appl. 6839
- absorption, influence of slit width 6848
- microwave, pressure broadening theory 6850
- r.f. historical survey 6851
- microwave absorption, freq. stabilization appl. 6852
- spark, mounting method for semi-microsample analysis 7366
- wave-number units 7500
- microspectrography 7661
- u.v. and i.r. microspectrography, refl. microscope 7662, 7666
- microspectroscopy, fixed and living cells 7663
- self-recording microspectrography, biol. appl. 7664
- infrared microspectroscopy 7667
- u.v. absorption, recent advances 7660
- absorption, of short-life substances 7697
- rotational and perturbations methods near 10 000 Mc/s 7701
- i.r., complex molecules 7706
- microwave, in molec. struct. det. 7744
- rocket exhaust flame rel. and press. meas. 7814
- u.v., tissue and cell structure det. 7926
- microwave, nuclear props. det., review 8120
- electronic wave nos. calc. 8621

Spectroscopy—*contd.*
- l.v. absorption study 8627
- light flux from extended source 9364
- microwave absorption lines Doppler breadth reduction 9385
- Sb–Cs photocathodes u.v.-characteristic 9481
- Sb–K and Sb–Na photocathodes, u.v. characteristic 9482
- use of separated isotopes 9646
- atmospheric invest., review 9847
- rapid recording of u.v. spectrum of sunlight 9849
- **light sources**
  - survey of practice 176
  - sliding spark, for far u.v. 1718
  - h.p. Xe arc., u.v. continuum 1788
  - for l.f. Raman spectra, organic crystals 2564
  - types for spectrochem. analysis 4326
  - continuous u.v. source 6117
  - homogeneous light-emitting volume, spectrograph illum. 6161
  - l.p., hot-cathode arc. fluctuations 6242
  - slit width influence on energy dist. 6837, 8617
  - filters for documents photographic study 7688
  - spectrograph. anal., CN band elimination 7798
  - isotope disch. lamps for length meas. 8615
  - infrared, incandescent W 8616
  - extended, refracting, light flux 9364
  - hot cathode discharge, external circuits and mag. fields effect 9506

Speech
- speech autocorrelation function 18, 2484
- articulation-index calc. 166
- side-tone delay effects 915
- "information theory" of communication 1690
- typology of languages 1691
- nature of linguistics 1692
- phonetics and linguistics, commun. theory 1693
- relation to language 1694
- communication pathology 1695
- vowel resonances, electrical vocal tract 1696, 5217
- visible records, compression and expansion apparatus 1697
- spectrum analysis 1698
- system-function analysis 1699
- reversed, and repetition systems, phonetic study 1700
- specification from acoustical meas. 1701
- amplitude-dichotomized, time quantized, intelligibility 1702
- delayed feedback effects 1703
- information transmission, "line" and hearing 2478
- language engineering 2479
- task-oriented group communication patterns 2480
- recorded, phonetic analysis 2481
- information theory conference 2482
- correlation function analysis 2483
- elementary statistics portrayal 2485
- sonograph and sound machines 2486
- singing voice, fundamental phenomena 3418
- sounds, representation and statistical analysis 3419
- language entropy and redundancy est. 3420
- effect of delay distortion 5218
- phoneme detector 6816
- operatic singers, vowel formants study 6817
- information and human ear 7432
- pattern playback apparatus 7645

Sphalerite
- refractive index 6557

Spin see *Fundamental particles*; *Nucleus, spin*; *Rotating bodies*

Spin-lattice coupling
- Mn, relaxation time 496
- paramagnetic relaxation effects 497
- nuclear quadrupole interactions in crystals 548
- review article 1972–3
- spin echoes 2922
- LiF single-crystal, relaxation times 3633
- MnF_2 very short 3640
- diluted paramagnetic salts 7088
- Mn^{++} ions in ZnS–Mn phosphors, paramag. resonance invest. 7091
- nuclear resonance in crystals 7382
- Cs Ti alum 9603
- relaxation times in metallic Na^{23} 9641

A complete list of the Subject Headings will be found at the end of the Index.

Spinors see *Quantum theory, spinors*

Sprays see also *Aerosols*; *Drops*; *Jets*
- drop-size distrib., new equation 8551
- electronic drop-size analyser 9077
- static electrification 9436

Standards see also *Length standards*; *Mass standards*
- surface roughness 1336
- radioactivity, history 7199
- standardization of radioisotopes 9648
- classification, review 9255

Star models see *Stellar structure*

Stark effect
- He in strong field 1722
- H, intensity asymmetry time-variation 2501
- isothiocyanic acid 2905, 7173
- H_α, weak field 3432
- He discharge, forbidden lines 4243
- H_β line 5256
- in H, low field-strengths 6104
- NH_3 inversion spectrum 6869
- first-order components, rel. intensity 7670

Stars see also *Astronomical spectra*; *Nebulae*; *Novae*; *Stellar clusters, motion, structure*; *Variable stars*
- RZ Ophiuchi problem 43
- surface temp. from Balmer lines 48
- origin, and *n*-body problem 1572
- luminosity dist., nearer stars 1583
- origin, sidereal assoc. theory 1584–5
- intergalactic, evidence for 2316
- O and B classes, movements and associations 2341
- evolution in dispersed clusters 2342
- hot giants, galactic dist. and origin 2347–8
- late F- and early G-type spectroscopic and dynamical correl. 2351
- statistics, incl. interstellar clouds 3287
- velocity dist. study 3289
- models for red giants 3296–7
- birth in L.M.C. 5041
- stellar populations, rel. to galaxies collisions 5043
- vel. and energy dist. studies 5045
- giants, development, Weizsäcker's theory 5048
- photoelectric photometry 5981
- He^3 occurrence, novae and white-dwarfs theory appl. 5996
- vibration stability and autovibration 6004
- *B*- and *A*-, Ne in ejected gases 6296
- in Praesepe and M 39, colour-luminosity arrays 6703
- colour/spectral-type relation, p.e. studies 6704
- sub-dwarfs, spectrophotometric study 6706
- F- and τ Ursae Majoris, spectrophotometry 6707
- white dwarfs, Russell diag. position 6709
- white dwarfs H content and energy-productive mech. 6715
- stellar-energy problem review (1945) 7485
- B-type, models constr. 7486
- A-stars rotational vel. from freq.-dist. curves 7491
- white dwarfs, electrostatic fields 7492
- H exhaustion and explosions 7495
- scintillations, photoelec. recording 8440
- rotation importance in evolution 9246
- heat and matter transport by convection 9249
- theory of degradation 9250–1
- **magnetism** see also *Sun*
  - stellar magnetic fields, rel. to sunspots 811
  - generation by fluid motion 9842
- **magnitudes**
  - red dwarf, Hertzsprung–Russell diagram 46
  - photographic scale, inhomogeneities 815
  - double stars, photoelectric det. 816
  - type I stars, luminosity function 1587
  - det., coarse gratings appl. 2338
  - red and i.r., 125 stars 5035
  - and colours, cepheid variable stars 5037
  - mass-luminosity-radius relation, invest. 6002
  - double star component differences, visual det. 7475
  - North Polar sequence and Harvard region C 12, revisions 7476
  - observation in E regions by Fabry method 9245
- **radiation** see also *Cosmic radiations, r.f.*; *Stellar structure*; *Sun*
  - empirical temp. scale from mass-luminosity rel. 47
  - white dwarfs, cooling 50
  - non-equilibrium envelope radiation 51

Stars—*contd.*
- **radiation**—*contd.*
  - stellar atmosphere opacity 53
  - Schuster problem 54
  - stellar atmos. "planetary nebula" problem 55
  - radio-frequency, review 792
  - B-stars, colour temperatures 817
  - "star-spots" and r.f. noise 1577
  - type I stars luminosity function 1587
  - spectral type theory, model atmospheres 1588
  - polarization by free electrons 1589
  - HD 190 073 Balmer discontinuity 1590
  - scintillation and atmos. turbulence 2219
  - scintillation recordings 2251
  - polarization, indication of interstellar mag. fields 4045
  - white-dwarf temp. det. 4061
  - scintillation, photoelectric observation 4947
  - in sun region, colour-luminosity array 5036
  - interstellar polarization expts. 5984
  - mass-luminosity-radius relation invest. 6002
  - radiative equilib., convective zone influence 6710
  - Be-stars, radiation field 7484
  - closed binaries, intermediate atmospheres 7490
  - radio-stars, analysis 8444
  - infra-red, Milky Way 8472

Statistical analysis see also *Errors*; *Probability*; *Random processes*
- particles continuum dist., stochastic processes 15
- correlated events 16
- least-squares method, curve approximation appl. 3266
- simplified, few obs. 5006
- search for periodicities 6678
- basic concepts, introduct. review 8430
- testing hypotheses 8431
- design of experiments for most precise slope estimation 8432
- experiments analysis, outline 8433
- bimodal size distrib. curves 9079
- **applications**
  - honeycomb and triangular lattice, applications 95
  - cosmic-ray particle estimation 412
  - electrical noise study 791
  - particle size dist. 1338, 3060
  - information theory conference 2482
  - autocorrelation, of speech sounds 2484–5, 3419
  - 3-dimensional ferromagnet 2822, 5550–1
  - random walks, elliptic diff. eq. eigenvalues 3263
  - factor analysis, cheese tests appl. 3265
  - high-energy proton collisions computation 3336
  - electrical noise, Brownian movt. appl. 3344
  - linear varying-parameter systems, stability 4031
  - auto-correlation, pulse-edges timing appl. 4119
  - linear filter study, optical method 4317
  - measurements scatter in optical pyrometry 4347
  - information quantity 5005
  - Mayer's liquids theory, simplification 5156
  - shower particle absorption 5522
  - theory of nuclear reactions 5729
  - static friction 5842
  - non-homogeneous turbulence 7590
  - particle dist. in grinding 8269
  - message adaptation to transmission channel 8429
  - waveform anal., time and freq. uncertainty 8434
  - physical characteristic det. curve analysis 8435
  - Wolf sunspot numbers prediction 8453
  - simple cubic lattice in ferromagnetism 8836
  - ionizing particles scattering in emulsions 9231
  - directive wave prop., correl. function 9343
  - electron-photon cascade shower fluctuation 9530
  - **counters**
    - scintillation counter resolving-time limitations 3588
    - errors theory, ionization chamber appl. 5494
    - analysis of gas counters 5692
    - radioactive standard calibration 6400
    - mechanical pulse-size analyser 7975
    - criteria of efficiency 9649

Statistical mechanics
- virial theorem and variation principle 91
- intermediate statistics 96
- many-body problem 97–8
- condensation of Bose–Einstein gas 99, 2398–9, 7566

Statistical mechanics—*contd.*
  He^3/He^4 liquid mixtures (erratum) 262
  Bose–Einstein gas, heat transfer 263
  Gibbs' method in irreversible change 274
  transport phenomena, mixed system 1663
  ditto, degen. Bose–Einstein gas 1664
  ditto, quantum hydrodynamics 9297
  Bose–Einstein liquids theory 4344
  diffusion equation, C in α-iron 656
  fundamental particles, relativistic and statistical distinction 860
  nuclear relaxation time 1229
  chemisorption appl. 1414
  Fermi–Dirac functions, evaluation 1627
  quantum-mechanical equation of state 1629
  statistical thermodynam. of multimolecular adsorption 2144
  nucleon gas, lighter elements origin theory 2304
  partitions into non-integral powers 2397
  thermodynamics of multicomp. systems 2427
  changes of state appl. 2607
  2nd-sound vel. predictions 2632
  nuclear shells theory 2909
  lower critical solution temp. theory 3154
  evaluation of configurational integral 3345
  rhombic S evap. rate 3483
  entropy and information 3501
  int. mech. equilib., fluids 4140
  gas mixtures, 2nd virial coeff. 4172
  pressure broadening theory 4244
  Bose–Einstein gas mobile multilayer adsorption 4345
  superposition approx., compressed gases 4354
  thermo-mech. of ionized fluids 4355
  order parameters 4898
  spin rel. to statistics, fundamental particles 5076
  virial theorem in quantum mechanics 5129
  regular mixtures 5132
  condensation phenomena 5133
  co-operative phenomena, lattices 5134
  communal entropy, dense systems 5374
  Nernst's principle, liquids appl. 5377
  "collective description" of electrons 5379
  adsorption from multicomponent systems 5879
  adsorption according to van der Waals' eq. 5880
  theory of solutions 6071
  liq. He, quantum hydrodynamics 6178
  thermomechanics, potential energy 6183
  thermomechanics of irreversible phenomena 6184
  currents in double diodes 6286
  phase change, appl. 6187
  quantum statistics of fields 6732, 9266
  Boltzmann–Maxwell dist. law, quantized form 6756
  quantum mechanics of interacting particle assemblies 6758
  antiferromag. and order-disorder transitions 6760
  Klein–Gordon eq. statist. interpretation 7552
  imperfect gas, Fermi's model 7567
  Bose–Einstein integral functions 7568
  entropy defn., rel. to thermodynamic defn. 7570
  dispersion of configurations of linked events 7571
  solid, dissolution in compressed gas, appl. 7623
  linear paramagnetic macromolecule 8038
  Thomas–Fermi eq., soln. for axial symmetry 8087
  atomic physics text-book 8111
  slow adiabatic changes 8536
  vap. press. small droplets 8586
  boundary laws of distribution 9285
  tensors appl. 9286
  multidim. oscillator assemblies, partition theory 9287
  gases, initial value problem 9337
  thermodynam. fluctuation theory formalism 9434
Steam
  heat conductivity, new meas. 251
Steel
  sigma phase, low temp. ferromagnetism 493
  deformation to produce rectangular hysteresis loop 498
  deformation, optical study 675
  plastically deformed, residual strains 678
  endurance limit invest. 687
  thermal conductivity meas. 1008
  rupture mechanism 1366
  cold-rolled, resistivity anisotropy 2680
Steel—*contd.*
  magnetic permeability rel. to tension 2878
  elastic limit, X-ray invest. 3100
  grain size, heating and cooling effect 3102
  deterioration under dry friction 3105
  pearlite and Cr magnet steel 3809
  plastic deformation, H segregation effect 3824
  scuffing, physical changes 3841
  internal friction meas. 4804–5
  fatigue fracture 5836, 9032
  Cr$_{23}$C$_6$ electron diffraction det. 6500
  Lüders deformation characteristics 6510, 9749
  gas adsorption room-temp. 6541
  C steels mag. permeability changes under tension in alternating field 7142
  heat conductivity, low temp. 8678
  polar org. compds. adsorption 9084
  mild, deformation and ageing 9750
Stellar clusters
  moving, convergent det. 42
  RZ Ophiuchi problem 43
  sidereal assoc. and stars origin 1584–5
  intergalactic, evidence for 2316
  globular, dynamical mass estimate 2340
  class O and B stars associations, extension 2341
  star evolution in dispersed clusters 2342
  self-gravitating star systems 3290
  double-star formation theory 4055
  evolution, theory 4056
  Pleiades, light deviation 5038
  moving, vel. det. 5039
  reverse movt. in galaxy 5998
  fluctuating forces field strength 8463
  globular, mass 8464
  globular, evolution 8465
  open, distance det. colour diff. method 8466
  review 8467
  regional differences in galaxy 8473
Stellar composition see also *Elements, origin*
  dynamics of accretive growth 58
  CH 4300 Å band intensity in F, G, K and M spectra 3295
  early-type stars, atmospheres 4064
  F-stars and σ Ursae Majoris, spectrophot. 6707
  rel. to mass, radius and luminosity 7493
Stellar constitution see *Stellar composition*
Stellar motion
  stellar dynamics theory 38
  space motion study 39
  star streaming dynamics 40
  Kovalsky's study 41
  moving cluster convergent, det. 42
  through igneous cloud, dynamics 2339
  O and B class stars 2341
  dynamics in sph. galaxies 3292
  moving star cluster vel. det. 5039
  galactic orbits circular vel. orientation 5040
  velocity and energy dist. studies 5045
  selection-effects and earth's rotation fluctuations 5054
  reverse movt. in galaxy 5998
  galactic rotation, differential effect 5999
  galaxy, gravitational potential 6000
Stellar structure see also *Cosmogony*; *Sun*
  red dwarf Hertzsprung–Russell diagram 46
  mass-luminosity rel., temp. scale 47
  surface temp. from Balmer lines 48
  red giants and Cepheid variables 49
  white dwarf cooling 50
  non-equilibrium envelope radiation 51
  mass-luminosity-radius relation 52, 6002
  stellar atmosphere opacity 53
  electron atmosphere scattering 54
  stellar atmos. "planetary nebula" problem 55
  solar atmos. thermodynamics 56
  solar atmos. emission fluctuation 57
  B-stars, colour temp. 817
  perturbation problem, variational solution 818
  turbulent stellar atmosphere model 819
  model atmospheres, construction 1588
  polarization by free electrons 1589
  Doppler broadening by turbulence 2319
  atmospheric turbulence 2336

A complete list of the Subject Headings will be found at the end of the Index.

Stellar structure—*contd.*
late F- and early G-type, spectroscopical and dynamical correl. 2351
turbulence and growth curve 2352
mass-luminosity rel. from spectroscopic binaries 3294
models for red giants 3296–7
extended atmos., radiation field 3298
variable stars 3299
propagation of shock waves 3300, 6714
white dwarfs, proton-proton reaction 3301
brightness temp., appl. to sun 4060
stellar atmos., radiation anisotropy 4062
Wolf–Rayet stars, free-electron migration 4063
Unsöld atmos., absorption and scattering coeffs. 4065
radiation polarization, stellar atmos. 4066
hydrodynamical studies 4067
element abundances, thermal and gravitational equilib. 5011
colour-luminosity arrays, p.e. studies 5036, 6703
white dwarfs and planets rel. 5046
Cepheids luminosity–velocity rel. 5047
non-radial pulsations 5049
late-type stars, atmospheres 5050
exact source functions 5051
convection zone equilib., stellar atmospheres 5052–3
velocity and energy dist., H.R. diag. 5405
novae and white-dwarfs theory, He^3 occurrence 5996
curves of growth 6003
vibration stability and autovibration 6004
matter and energy, cosmic conditions, review 6005
adiabatic and radiative zones connection 6006
thermal cond. of dense matter 6164
colour/spectral-type rel., p.e. studies 6704
double-stars equilib. figure 6705
white dwarfs 6709
radiative equilib., convective zone influence 6710
temp. dependence of energy prod. 6711
radiative transfer in absorption lines 6712
reflection effect in eclipsing binaries 6713
white dwarfs equilibrium state 6715
atmos., rotation law 6718
secondary sequences in H.R. diagram 7482
Be-stars, radiation field 7484
stellar-energy problem review (1945) 7485
B-type star models 7486
stellar atmos. rel. to temp. and grav. 7489
closed binaries, intermediate atmospheres 7490
white dwarf electrostatic fields 7492
H exhaustion and explosions 7495
stellar envelopes and central condensation 8475
Lyman continuum radiation transfer eq. 8476
photospheres convection 8477
early O-type star model atmos. 8478
O-type spectra H line luminosity effects 8479
rotation importance in evolution 9246
Hertzsprung–Russell diag. interpretation 9248
heat and matter, convection transport 9249
max. stable mass 9251

Stereochemistry see also *Isomerism*
Pb and similar metals 1458
aralkyl chlorides solvolysis, intramol. config. effect 4822
imidazolidine ring 4870
tripyramidal bond orbitals 5651
acraldehyde, crotonaldehyde, electron diffraction 9096

Stereoscopy
electron microscope technique 3565, 6498
high-speed Schlieren system 4992
role of convergence 5950

Storms see *Magnetic storms*; *Thunderstorms*; *Weather forecasting*

Strain gauges
applications, conference 100
multichannel, in strain analysis 861, 4127
symposium 3814
bonded wire resist., manometer appl. 4133
instantaneous internal friction meas. 8257
pressure of gas evolved in reaction 9052
magnetostriction meas. 6372, 7141

Strength see *Mechanical strength*

Stress analysis see also *Bending*; *Photoelasticity*; *Strain gauges*; *Torsion*
recent developments, conference 100
plastic deformation propagation in solids 680
redundant systems, conservation of energy 2401
close-coiled helical springs 3347
penny-shaped crack under shear 5136
hole in rubber sheet 5826
photoelastic models, stress trajectories 6046

Stress measurement see *Dynamometers*

Stress/strain relations see also *Elastic constants*
metals, curve forms 665
rubber under biaxial strain 666
plasticity theory effective stress and strain study 681
glass viscosity, rate-process theory 684
new variational method 1359
finite strain, linear theory 1360
Pt wires, plastic flow 1368
deviations from stability domain 1370
finite elastic straining 2092
ingot iron, low temps. 2105
Fredrickson–Eyring theory 2106
Al crystal discontinuous elongation 3093
thixotropic and plastic flow mech. 3825
non-linear, cast iron and concrete 4798
in compressed powder 4809
defects of accepted theory 8255
plasticity theory extension 8264
thin tubes distortion in plastic range 8265
twisted elastic prism 8270

Stresses, internal
glass, rel. to thermal transformation 269
interferometric, of quenching stresses 667
Bourdon tubes 1365
in powdered mass, photoelastic method 1780
energy absorption, Cu deformation 2096
elasto-anisotropic bodies, breakdown 2102
associated with inter-crystal boundaries 2107
temperature, in irreg. solids 3069
thick tube under int. press. 3084
sheets, det. by removing layers 3085
rel. to fatigue microcrack formation 3104
close-coiled helical springs 3347
quenching, photoelastic invest. 3815
wire residual stress det., formulae 4792
lattice transformation, temp. interval 4795
transverse, in tensile tests 4801
fatigue mechanism 4804–5
metallic electrodeposits 5821
wire, effect on elec. resist. 6229
hereditary elasticity, Volterra's eq., solns. 6504
visco-elastic solid, additional binding forces effect 7324
glass butt seals 7325
metal physics progress 7439
plastic-rigid body at yield point 8267
moving Griffith crack 8274

Stroboscopes
interference obs. of vibrating plates 3407
for high-speed flash photography 4026, 9904
for all frequencies, and musical strobographs 7643

Strontium nitrate
elastic constants 1478
and KNO_3, crystallization, radio Sr invest. 3387

Strontium oxide
photoelectric changes due to u.v. irradiation 1845
vaporization study 2608
reduction by W in vacuum 3117
evap. products from Pt 9567

Strontium titanate
Pb and Sr mixed titanates, dielectric properties 1038
dielectric permittivity 6197

Sublimation see also *Heat of sublimation*; *Vaporization*
solution of solid in compressed gas 7623
rate, in gas stream 7810

Succinic acid
first dissociation const. 5860

Sucrose
sugar dielectric constants 1039
diffusion of solution 5159

Sulphur
zero-pressure thermodynamic properties 275
liquid, ultrasonic sound velocity at 12 Mc/s 908

A complete list of the Subject Headings will be found at the end of the Index.

Sulphur—*contd.*
isotopic compds., thermodynamic properties 1026
vapour, viscosity meas. 1655
orthorhombic, elastic constants 3090
rhombic, evap. rate and vap. press. 3483
S_8, spectra, structure 4260
mass of S^{35} from spectra 5677
vapour, dissociation 5855
monoclinic-rhombic trans. 5905
S^{35} diffusion in NaCl 6490, 8241
photoconductivity, charac. 6972
solid, diffusion coeff., tracer det. 7305
analysis in petroleum by X-rays 8329
Sulphur dioxide
liquid, O exchange with $SOCl_2$ 3854
crystal structure 5923
Sulphur hexafluoride
ultrasound vel and absorption, crit. temp. region 4183
intermolecular potential 6789
gaseous, compressibility 7608
Sulphuric acid
films, use as hygrometer 9797
Sun see also *Corona*; *Prominences*; *Sunspots*
shock-wave propagation in atmos. 33
granulation brightness fluctuations 810
influence on geophysical events 2191
atmospheric turbulence 2336
evolutionary curve, rel. to main stellar system 2342
accretion of matter theory 3271
planets origin hypothesis 3272
e.m. field of spots in sun's atmos. 3283
floccular and sunspot activity correlation 4052
flocculi latitude migration 4053
hydrodynamics of structure 4067
pulsation, data 5022
energy, Bethe's theory outline 6687
search for He^3 6688
Li and internal circulation 6689
granules, radial vel., interpretation 6694
microturbulence and equiv. line widths 6695
radio-energy, effect on geomagnetism 7465
activity, cyclic behaviour 8455
magnetism
effect on r.f. radiation 806
general field from thermal noise polarization 808
solar magnetic field meas. 811
sunspots, magnetic flux 3284
effect on earth's rotation 3302
radiation see also *Astronomical spectra*; *Sunlight*
intensity dist. at disk edge 30
green coronal rays, statistics 35
solar atmos. thermodynamics 56
solar atmos. emission fluctuations 57
granulation contrast 810
Laplace's relation, automatic inversion method 1581
u.v., improved geomagnetic activity index 1582
polarization by free electrons 1589
electrodynamics appl., textbook 2309
interpretation of wavelength shifts 2326
u.v., rel. to 27-day cosmic-ray period 2798
u.v. from chromosphere 3280, 9239
activity, characteristic numbers 3282
analysis of observations 3983
neutral ionized gas, model expt. 3998
spectral-energy dist., centre of disk 4049
cosmic-ray protons in sunspot fields 4050
continuous, from centre 4060
cosmic-ray neutrons, rel. to disturbances 4508
radiation temp. centre of disk 5027
neutrons 5029
u.v. from flares 7415
photosphere opacity, 6 700 Å to 23 000 Å 7463
atmos. struct. from limb-darkening 7464
photosphere struct. and blanketing effect 7488
electrons, protons 8452
ionization equilib., chromosphere 8456
extreme u.v., X-rays, by rocket meas. 9209
observational methods and records 9848
radiofrequency
radio astronomy, reviews 23, 792
r.f. solar atmos. representation 31
research up to 1948, survey 32
model chromosphere from radio data 34, 6698

Sun—*contd.*
radiation—*contd.*
radiofrequency—*contd.*
50-cm, in 1948 eclipse 803
10-cm, distribution over disk 804
1·25-cm, intensity variation and dist. 805
from quiet sun 806
3·18-cm, rel. to other solar phenomena 807
thermal noise polarization, rel. to mag. field 808
1 200-, 600- and 200-Mc/s 809
radio noise, survey 1575
sunspot cosmic-ray acceleration 1577
equiv. path and absorption in corona 2327
high-intensity spectrum, spectral types 2328
high-intensity spectrum, outbursts 2329
comparison on 2 adjacent frequencies 2330
Bailey's circularly-polarized waves theory 2334
"temperature" and equilib. conditions, rel. to noise 3279
feeble-intensity disturbances invest. 3281
new developments, conf. 4046
interpretation of bursts 4047
coronal emission, mech. 4048
16·7-cm noise, characteristics 5023, 6686
high-intensity, metre, spectrum 5024
metre, "enhanced radiation" 5025
two large disturbances 5026
solar atmos. motion deductions 5028
long-period change, quiet sun 5990
Kew records (1933–46) 6640
temp. grad. in Sun's atmosphere 6690
81·5-Mc/s, dist. across solar disk 6691
noise bursts assoc. solar flares 6692
3·7-m from sunspot 6697
generation by multistream charge interaction 7112
magneto-ionic origin, theory 7125
bibliography 7456
cosmic-ray protons as source 8447
from sunspots, polarization reversal 8450
3300-Mc/s, study 8451
localized high-temp. regions 8452
corona invest., new method 8458
Sunlight see also *Sky brightness*
u.v. radiation integration, glass-rod method 2197
polarization of sunlit sky 2222
measurement, review 3965
intensity at ascending radiosonde 3971
u.v. rel. intensity, Finland 3982
analysis of radiation obsns. 3983
solar, Kew records (1933–46) 6640
u.v. radiation from solar flare 7415
extreme u.v., X-rays, by rocket meas. 9209
absorption by clouds 9211
scattering by earth's atmos. 9216
observational methods and records 9848
u.v. spectral distribution 9849
Sunspots
and r.f. radiation 31
interpretation, review 811
cosmic-ray acceleration and r.f. noise 1577
geomagnetic activity lag, explanation 1582
r.f. radiation spectral type 2328
character figures, meaning 2331
coming minimum, prediction 2332
apparent earth-effect 2333, 6693
Bailey's circularly-polarized waves theory 2334
"ionosphere solar index" 3234
magnetic flux calc. 3284
average curve 4051, 7467
activity, correlation with flocculi 4052
latitude, rel. to that of flocculi 4053
hydrodynamical study 4067
rel. to shape of corona 5992
rel. to cosmic-ray var. 6309
Evershed effect 6696
3·7-m radio emission 6697
radio-electric activity, effect on geomagnetism 7465
modification in prediction method 7466
microwaves, polarization reversal 8450
Wolf numbers prediction 8453
intensity variations 9240
Superconductivity
Bose–Einstein gas model 263
in CuS 319

Superconductivity—*contd.*
Va, study 320
rel. to Debye modes 321, 1064
in Sn–Ge "alloys" 322
isotope effect and lattice properties 323
PbS, PbSe, PbTe 324, 9490
theory; ground state at zero 325, 2704
superconductive alloys, heat flow 326
e.m. forces on superconductor 327
In atomic heat, liquid He temps. 1021
CbN 1065
thermo-e.m.f. at supercond.-normal junction 1066
Sn, Hg, In and Ta 1794
superconducting electrons, wave functions 1846
quantum-mechanical theory 1847
Tisza's theory 1848
Cb 1849
Sn isotopes 1850–1, 8742
specific heat, theoret. and exper., deviations 1852
"nucleus" theory 2698
Sn surface resist. meas. 2699
Hg T_c mass dependence 2700
electronic sp. ht., rel. to transition temp. 2701
Ni 2702
2 new superconductivity elements 2703
magnetic props. at 0°K 2704
anomalous heat flow 2705
Sn, mag. moments and eddy currents 2706
Landau diamagnetism and Meissner effect 2707
free electrons, perfect diamagnetism, appl. 3532
transition temp., condition determining 4395
London theories, rel. to lattice vibration 4396
quantum theory appl. 4397
reflection effects in non-linear theory 5419
London's choice of gauge 5420
penetration depth, field var. 5421
superconductor adiabatic magnetization 5422
superconductors thermoelec. prop., correl. 5423
electromag. relaxation 5424
non-equilib. thermodynam. appl. 6179
h.f. resist. and distortion of a.c. on d.c. 6227
generalized phenomenological theory 6228
generalized theory, electrodynamic potl. 6978
Al, Cd, Ga, Zn, critical mag. fields 6979
diamagnetism of free electrons in finite systems 7071
penetration depth expts. in Hg, Pb and Sn 7903
surface energies, negative 7904
of superconductors, negative 7904
criterion for distinguishing 7905
PbS, not confirmed 7906
interaction of lattice vibrations with electrons 7907, 8743
Fröhlich's theory difficulty 7908
Sn, Pb, In, penetration of mag. field 7909
Bi$_2$K 9484
non-linear generalization of London theory 9489
rel. to effective electron mass 9493
rel. to crystal struct. 9492
in rotating metal spheres, liq. He temp. 9485
transition kinetics 9486–7
destruction by alternating current 9488
Pb isotopes 9491
sp. ht. of metals, low temp. 9494
intermed. state, unbranched laminar model 9495
use of separated isotopes 9646
Supercooling
supercooled liquids, dielectric properties 292
pure metals, rel. to crystal structure 742
water, freezing nuclei function 3386
condensation of water in shock waves 3490
low temp. behaviour 4160
specific heat, amorphous state 4351
cloud formation, review 7417
liquid phosphorus 7809
phenyl ether, surface tension 9310
ionic melts, discontinuities 9323
supercooled water freezing 9420
Superfluidity
film transport in liq He II 261, 1015, 6931
and thermomechanical effect in adsorbed He II film 1016
thermomoechanical effect 1801
Superfluidity—*contd.*
film transfer, effect of geometry and temp. gradien 1802
ditto, infl. of radiation and impurities 1803
ditto, on glass and metals 1804
He II, oscillating-disk expts. 2624–5
pressure meas. 2626
film thickness meas. 2629
liq. He, fine channels 6176
pressure gradients 6177
transport effect peculiarities 6929
sub-critical flow 6930
pure He prep. method 7818
formulation of hydrodynamics 8695
2-fluid model, thermodyn. eq. of motion 8697*
liq. He II flow through wide capillaries 9430
Supersonic flow see also *Shock waves*
Ames Laboratory wind tunnels 134
perfect gas in Laval nozzle 135
compressible fluid, transonic potl. flow 885
disturbance reflection at boundary layer 892
propagation of disturbance from moving source 166
approx. permanent, uniform, theory 2443
at Mach number 10–16 2446
symmetrical, conical, perturbation method 2447
2-dimensional, along curved wall 2448
Karmon–Tsien relation, jets 2449
density meas. by X-rays 2450
shock-wave/boundary-layer interaction 2451, 7617
local, round symmetrical profile 3397
oscillating, tip effect 3400
conditions at sharp edge 3401
compressible flows, review 4167
attached shock-wave apex curvature 4169
transonic slip 5170
shock waves, general consistency relations 5181
homographic approx. appl. 6788
study with ultrasonics 7615
air condensation 7616
similarity laws, hypersonic flow 8580
round wedge, solns. for field 8581
round cone, solns. for field 8582
laminar boundary layer calc. 9333
Supersonics see *Ultrasonics*
Surface energy
drops and bubbles, radius dependence 113
Kelvin's contributions 708
charcoal, rel. to expansion on adsorption 2142
fatigue microcrack formation 3104
low-energy surfaces, spreading, polytetrafluoro ethylene 3380
free-electron metal, calc. 5628
surface eq. of state, charged films 7599
Surface ionization see *Ionization, surface*
Surface measurement see also *Area measurement*
powders, air flow method 104
by N adsorption from N–He mixtures 3875
Forster optical instr. 4128
powder, new method 4129
gas adsorption method, kinetics 4861
powders, adsorption method 5881
specific surfaces, electron microscope det. 7311
adsorption method 8999
solids, adsorption methods calc., comparison 9786
non-porous powders, permeability method 9788
Surface tension see also *Bubbles*; *Contact angle*; *Drops* *Films, liquid*; *Foams*
drops and bubbles, radius dependence 113
expanded films, critical area 114
alkali-halide solutions 116
sliding drops 876
rate of lowering, rel. to foaming 2138
force on surface in viscous fluid 2420
water, temp. dependence 2421
crude oil, rel. to press. and temp. 2422
crystalline surface 3057
molecular exchange forces invest. 3150
interfacial, between aq. sugar solns. and a paraffi and alcohol 3534
in multilayer gas adsorption 4062
diffusion coeffs. surface-active solutes 5153
amalgam/electrolyte wedges 5154
small droplets, rel. to size 5155

Surface tension—*contd.*
- flotation, interfacial tensions 6060
- boundary layer study, sapoalbin appl. 6063
- liq. flow under interfacial tension 7596
- hydrocarbon-water systems, interfacial props. 7597
- liq., influence on "wetting effect" 7600
- metals, sparks effect, X-ray invest. 8249
- hole theory calc. 8557
- solids, calc. from contact angle 8558
- solids, det. from "wetting effect" 8559
- solids, "liquostriction" 8560
- oil-water interfacial tension 9083
- metals, formulae 9308
- liquid metals, rel. to at. wt. and at. vol. 9309
- supercooled phenyl ether 9310

Surface tension measurement
- liquid-air and liquid-liquid contracting-jet meas. 3163–4
- solutions, by stationary-waves 3165
- viscous liquids, new method 6059
- paraffin-wax frothers, tilting-plate method 6061
- wetting tension, suspended-plate method, time-variation 6062
- liquid metals, from density data 6064
- simple apparatus 7595
- slightly soluble film, extrapolation methods 7598

Surface texture
- reflection phase change effects 226
- metal single crystal 746
- radioactive metal invest. of surface damage 866, 3845
- roughness effect on sliding drops 876
- metallurgical appl. fluorescence methods 1335
- surface roughness standard 1336
- plastic crystals, machined optical surfaces 2075
- Rehbinder effect invest. 2112
- glass surface polish, phase-contrast invest. 2595*
- solid lubricants invest. 3838
- polarized light exam. of metals 4302–3
- metallic electrodeposits 5821
- isotopic exchange rates as criteria 5850
- polished metals 6501
- electrolytic polishing theory 6534
- cryst., equilib. struct., rel. to growth 6560
- NaCl, effect on internal friction 8258
- polished layers 9039
- X-ray thickness meas. 9130
- exam. by slit microscope 9410

Suspensions see also *Aerosols*; *Sedimentation*; *Sols*
- electroviscous effect 333
- deposition of sand 661
- viscosity and sedimentation 865
- C-black in hydrocarbons, stabilization 1443
- rough powders, viscosity and sedimentation 2408
- viscometers 2409
- non-aq. disperse systems, electrical props. 3508
- organic dispersions electrophoretic behaviour 3534
- Al in vaseline, conducting-bridge formation 3550, 6248
- elastic dispersions, flow properties 3365
- thixotropic, particle shape 4857
- interfacial tensions, flotation 6060
- carbon/oil, elec. conductivity 6219
- of spheres, dia, effect on viscosity 6769
- elec. parameters 6951
- motion and precipitation in divergent elec. fields 6980
- electrical effects due to sound waves 6981
- conc., of spherical particles, viscosity 9074
- rheology and stability 9075

Swelling
- amorphous polymers under strain 715
- nuclear emulsions, temp. coeff. 775
- high polymers, interferometric studies 1651
- silicate glasses in acid solns. 3142
- cellulose, heat of wetting var. 3153

Tables, mathematical
- Coulomb functions 2391
- definite integrals 3250
- checking and interpolation of polynomials in log x 3256
- phase factors for 2-dimensional Fourier synthesis 5916
- X-ray diffraction, angles and spacings 6578

Tables, mathematical—*contd.*
- solutions of Helmholtz's equation and others 7449
- arc tangents of rational numbers 9227
- $n!$, $\Gamma(n+\frac{1}{2})$ 9228

Tables, physical see *Collections of physical data*

Tantalum
- thermal conductivity at liq. He temps. 1794
- Schottky-effect deviations 2776
- vapour pressure (2 624–2 943°K) 3487
- polished, Schottky effect deviations 4489
- high-temp. struct. and thermal expansion 4908
- abs. magnetic susceptibility 5575
- evap. film, elec. cond. 7887
- abs. energy loss of 1·8 MeV protons 7956

Teaching
- magnetic field definition 483
- electronic pile simulator 630
- unified approach to physics 8490
- Newton's 2nd law, Atwood's machine appl. 8538
- lecture-room chart plotter 9257
- moment of inertia det. 9291
- voltmeter demonstration of phase shift 9609
- physics, suggested improvements 9253–4

Technetium
- magic numbers explanation 6387

Telescopes
- **astronomical**
  - anallactic systems 248–9, 6826
  - photographic image calibration 926
  - luminosity, Stiles–Crawford effect influence 1787
  - new, chromospheric, for $H\alpha$ observation 2306
  - thermal deformation corrections 2307
  - spectrograph 2308
  - new Leitz instr. 4125
  - dioptometer appl. 4325
  - Bamberg reflector, elec. controls 5007
  - solar, servo guider 5980
  - efficient illumination of graticule 6906
  - astigmatic correction 7797
  - Schmidt telescope studies 8438

Tellurium
- activation energy changes 1061
- single crystals, Ettingshausen–Nernst effect 4565–6
- film, resistance, Hall effect, mag.-resist. 6218
- photoconductivity, charac. 6972

Tellurium sulphide
- semiconductor, irradiation effect 7860

Temperature
- empirical scale from mass-luminosity rel. 47
- true temp. rel. to black-body temp. 1022
- controllers, stability, heat transfer effect 8674–5

Temperature distribution
- temp. stresses in irreg. solids 3069
- wall-stabilized arcs, calc. 4401
- heat conduction problem 5349
- near heated cylinder 6165
- along radiating gas stream 7815

Temperature measurement see also *Pyrometers*; *Thermocouples*; *Thermometers*
- Pt thermocouples *in vacuo*, high temp. 271
- temp. field of C arc 337
- optical pyrometer nomograms 1022
- thermistor resistance/temp. rel. 1063
- at low temps., review 1808
- resist./temp. rel. for low temps. 1811
- in gas discharge, survey 1862
- air temp. recorders 2195, 9191
- non-contacting thermocouple 2637
- multi-channel recording apparatus 2639
- Pt thermohm tables, calc. and use 3498
- German indust. meas. and control 4346
- wall-stabilized h.p. Hg arcs 4409
- phase changes at high temps. 4813
- W ribbon lamp photographic calibration 5365
- near heated cylinder, interferometric 6165
- black-body, abs. method 7650
- of skin 8389
- Ohio cryogenic lab. temp. scale 8699
- high temp. in gas streams 8701
- thermocouple data tables 8746
- wall temperatures 9433
- **spectral methods** see also *Pyrometers*
  - stellar surface temps. 48

Temperature measurement—*contd.*
spectral methods—*contd.*
jet-engine exhaust gas, spectrophotometry 1013
gaseous nebulae, electronic temps. 2350
h.p. arc columns 2717
flame temps. in l.p. combustion chambers 4340
flames, OH bands invest. 5356, 7671
metallic arcs 6181
in arc columns 6237
Gerdrén arcs, column 6238
Tensors
complex tensor calculus 1
in piezoelectric and electrostrictive investigns. 302
e.m. stress tensors 1192
invariant, dimensional analysis appl. 4028
piezo- and electro-optic eq., tensor form 6206
identities in wave-tensor calculus 6754
Bose–Einstein and Fermi–Dirac statistics appl. 9286
Terrestrial electricity see also *Atmospheric electricity*
finite conductive slab, e.m. field 1531
ground resistivity prospecting 3959
effect of thunderstorms 3996
interior conductivity from mag. field var. 6610
Terrestrial heat see *Earth, heat*
Terrestrial magnetism
main field, origin and variations, review 757
electrodynamics appl., textbook 2309
theoretical effect on cosmic rays, review 2799
observations reduction, new criteria 3220
field of earth and world ocean 3225
effect on ionospheric tides 3976
earth's field origin, new theory 4912
baked clays and rocks, mag. props. 6330
amplifier for use with detectors 6611
*F*2-layer critical freq. world dist. 6630
bird navigation theory 6656
whirl theory of gravitation 7507
effect on radiowave propagation 8066
ionosphere electron density rel. to mag. activity 9204
caused by rotation 9258
magnetism generation by fluid motion 9842
variations see also *Magnetic storms*
main field, review 757
vertical anomalies over veins 1525
igneous rocks, magnetic properties 1526
irregularities, ionized air current effect 1527
"sudden commencements" 1528, 3222, 6616
solar activity effects 1582, 6612, 7465, 8369
K-indices for polar year 1932–3 3221
phase-law in earth currents 3224
telluric survey, limitations 3958
moon's influence on telluric currents 6609
rel. to interior conductivity 6610
rocks magnetization invest. 6613
secular, hypotheses 6614
solar diurnal, longitudinal inequality 6615
rocket invest. upper atmos. 6624
geomag. bays rel. to ionospheric bays 6632
diurnal, rel. to upper atmos. conduct. 6651
ionospheric currents, rocket invest. 7398, 8370
secular, analysis 7399
due to solar u.v.? 7415
rocks magnetization reversal 8368
microvariations, new types 9183
rel. to earth's rotation 9184
Huancayo geomag. disturbance, normality 9185
Tetraethylammonium iodide
diel. const. of solution 6195
Thallium
diffusion coeff. in Hg 3180
Thallium bromide
iodide and chloride mixed crystals, thermal conductivity 2599
Thallium bromoiodide
single crystals, optical surface machining 2075
Thallium halide
photoelec. sensitivity and opt. absorption 8738
Thallium sulphide
Tl_2S cells photoconduct. 4388
Thermal conductivity see *Conductivity, thermal*
Thermal diffusion see *Diffusion, thermal*
Thermal expansion
rocksalt, isothermals calc. 1027

Thermal expansion—*contd.*
magnetite and fluorite 1476
Ba–Sr titanate ceramics 1717
alkali halides, X-ray and direct meas. 2605
Cu, isotropy 2606
NH_4Cl and NH_4Br crystals 3188
AgCl, LiF, MgO crystals 3189
metals and alloys, glass-metal seals 3480
coeff., cubic elements 3481
optical cryst. matls. 4229
low-temp., conduction electron contrib. 4329
radiographic dilatometry 4330
micrometric dilatometer method 4331
Au–Cd alloys 4332
Pt, Ta, Nb, Mo, X-ray diff. det. 4908
Ba–Pb titanates 5395
supersensitive thermoelements 6166
Se 6208
ferrites, ferromag. anomaly 6328
vol./temp. rel. for Teflon transition 7807
rel. to melting point 7808
α-monoclinic Se 8684
p-nitroaniline and *p*-dinitrobenzene 8685
anisotropic bodies 8687–8
magnetite single crystals 8831
artificial graphites 9418
Thermal measurements see *Calorimetry*; *Conductivity, thermal*; *Temperature measurement*; *Vapour pressure measurement*
Thermal transformations see also *Boiling*; *Melting*; *Vaporization*
He, liq.-solid, near abs. zero 266
glass, rel. to internal stress 269
dilatometer study 1337
liquids, phys. props., discontinuities 1648
critical phenomena review 1798
effect on Cu_3Au thermo-elect. power 1855
Pb zirconate phase transition 2178
elastomer thermal conduct., 2nd-order transitions 2598
change of state, theories 2607
supercooled phase stability 2614–15
solid alcohols, rotational transitions 2642
metals, rapid heating and cooling effect 3102
quartz inversion, high press. 3491
phase order in β-brass and Cu_3Au 3910
$PbTiO_3$, phase transition X-ray study 3929
yellow P at low temp. 4338
Na and K niobates 5394
Ti, thermoelectric props. 5427
molecular, force field influence on affinity 6183
transitions in rubbers 6507
solid hexadecane and octadecane transition points 6921
quartz $\alpha \rightleftharpoons \beta$, gases adsorption effect 6925
dolomite decomp., X-ray study 7391
bariumdicalcium propionate phase transition 7806
Teflon room-temp. transition 7807
substituted NH_4Cl 7811
phys. chem. textbook 8280
CsCl thermal transition, rel. to struct. 8356
long chain acid amides 8686
anisotropic bodies 8687–8
ζ-phase in Ag–Zn system 9146
supercooled phenyl ether surface tension invest. 9310
Hf, allotropic 9423
Thermionic emission see also *Ionization, surface*
W evaporation rate 408
electrons see also *Cathodes*
oxide cathodes, effect of coating composition 405
thoria, properties and activation 1145
thoria cathodes, thermo-electronic processes 1146
boride cathodes 1892
field at cathode as space current function 1893
ThS thermionic props. 1895
thoria-coated filaments, base-metal effects 1896
Al_2O_3 cathode coating invest. 2681
nitride, boride and carbide refractories 2775
Ta Schottky-effect deviations 2776, 4489
valve residual vacuum factor characteristic 3596
pure metal surface, eq. 3598
borides of alk.-earth and rare-earth metals 3602
cathode field in diodes, space-charge conditions 4479

Thermionic emission—*contd.*
  electrons—*contd.*
    electron vel., transit times, etc., space-charge diode 4481
    from W-carbon and Mo-carbon systems 4487
    BaN$_6$, BaO, SrO emission patterns 4488
    oxide cathode eq. 4492
    Pt-coated W 5508
    thin semiconducting films 5510*
    heat/elec. energy transformation 6290
    semiconductors 6291
    oxide cathode in impulse conditions, mechanism 7045
    bombardment-enhanced, origin 7046
    influence of radioactivity 7986
    anode potl. effect on saturation emission 7988
    from illuminated (Ba–Sr)O cathodes 8807
  ions
    investigation, applications 1898
    from W hairpin cathodes 3601
    W filament, K ions lifetime 5513
    acoustic transducer 8809
Thermionic tubes see *Electron tubes*
Thermochemistry see *Heat of reaction*
Thermocouples
    Pt, in vacuo at high temp. 271
    wire, sheet and "scale" types as bolometers 2488
    non-contacting radiation device 2637
    multi-channel temp. recorder appl. 2639
    German indust. instrum. 4346
    semiconductors thermo-e.m.f. rel. to temp. difference 6231
    Peltier effect power generation appl. 8745
    reference tables 8746
Thermodynamic potential
    chemical potentials, equilib. conditions 1813
Thermodynamic properties see also *Critical constants*; *Entropy*; *Heat capacity*; *Heat of reaction*; *Latent heat*; *Thermal transformations*; *Thermodynamic potential*
    H, *P–V–T* properties 126
    wind-tunnel and jet-engine gases 252
    some monatomic gases, zero-pressure 275
    CO and N, zero-pressure 276
    He 277
    2nd enthalpy coeff., dry air 278
    CO$_2$, 0°–600°c and 50 atm. 279
    H$_2$O$_2$ 280
    S isotope compds. 1026
    paramagnetic cupric salts 1183–4
    benzene-diphenyl system 1388
    liquid He^3 1805
    isotopic N$_2$O molecules 2540
    NOCl, NOBr thermodynam. functions 2541
    polymers, by light scattering 2588
    ZnSO$_4$ hydrated, low temps. 2646–7
    F, thermodynam. functions 2649
    tetrachloroethylene, rel. to vibrational assign. 2897
    hydrocarbons and fluorocarbons, evap. characteristics 3486
    LaCo(CN)$_6$ 3858
    high polymer solns. 4155
    trichloromethanes 4262
    gaseous Ti 4353
    statist. thermodynamics compressed gases 4354
    binary liq. Cd soln. 4356
    Hg, sat. liquid and vapour 5369
    polyatomic molecules, calc., integration appl. 5376
    ideal liquid mixtures, adiabatic compressibility 6065
    reactive gas mixtures 6935
    substituted ethanes 7735
    O$_3$ 8099
    argon, 0–2 000 atmos., 0–150°c 8574
    nitrosyl chloride 8631
    SiF$_4$ calc. 8881
    CO$_2$–ethylene, conformal solutions appl. 9322
Thermodynamics see also *Entropy*; *Equations of state*; *Thermodynamic potential*
    of non-isothermal systems 121
    He liquid-solid transformation 266
    n-variable systems, theory 273
    irreversible change, statistical method 274
    thermal diffusion equation 879
    liquid He in He^3–He^4 solutions 1019
Thermodynamics—*contd.*
    Onsager's principle 1025
    analogy between entropy and economic concept ophélimité 1028
    Nernst theorem and sp. heats ratio near abs. zero 1029
    oscillator contributions to thermodynamic functions 1221
    classical, and reaction rates near equilibrium 1395
    non-equilib., and liquid He II 1809
    thermodynam. temp., gas thermometer theory 1810
    statist., of multicomp. systems 2427
    changes of state, theories 2607
    Le Chatelier–Braun principle, unorthodox versions 2651
    lower critical solution temp. theory 3154
    Maxwell's demon., information and entropy 3500
    statistical, entropy of information 3501
    well-informed heat engine 4358
    Nernst's principle, liquids appl. 5377
    curve differentials appl. 5372
    non-equilib., of two-fluid models 6179
    thermomechanics, potential energy 6183
    irreversible phenomena, thermomechanics 6184
    mech. eq., flow-velocity significance 6185
    H in high-temp. heat engine 6186
    statist. mech. of phase change 6187
    2nd law, wave mech. appl. 6755
    availability and irreversibility 6936
    calculations, analogue computer 6937
    equilib., general conditions 6938
    of Bose gas 7566
    entropy const. and 3rd law 7570
    textbook 8706
    multi-dim. oscillator assemblies 9287
    fluctuation theory, formalism 9434
    2nd law, inapplicable to ∞ universe 9435
  applications
    n-variable systems to piezo-electric crystal 273
    galvanic cells, Gibbs–Helmholtz appl. 699
    co-operative phenomena, approximation method 748
    burner-tube, irreversibilities effect 888
    1st law, solid and fluid dielectrics 1030
    H–Ti system invest. 2115
    partition theory 2397
    mechano-caloric effect cooling in He 2622
    Clark cell 2647
    semiconductor instability 2684
    monolayer adsorption on solids 3159
    adsorption 3160, 9087
    int. mech. equilib., fluids 4140
    liquids int. energy invest. 4150
    thermo-mech. of ionized fluids 4355
    fluid dielectrics 4357
    crystal surfaces free energies 4900
    thermo-mechanics of transport phenomena 5371
    electrostriction in Onsager liquids 5399
    ternary amalgams, invest. 5811
    A adsorption on graphite, phase transitions 6540
    living fibres and muscles 6655
    flow through Laval nozzle 6772
    critical point, relations 6939
    compressed gases, thermal diffusion 7605
    thermomag. and galvanomag. effects 7828
    Mn oxidation states 8281
    intermolec. forces det. from eq. of state 8584
    liq. He II eq. of motion 8697*
    gas flow, heat engines, etc., textbook 8706
    electric and magnetic forces, direct calc. 9451–2
    thermoelec. effect suppression at v. low temps. 9497
    plastic deformation at finite velocity 9751
Thermoelectricity see also *Thermocouples*; *Thermopiles*
    Wiedemann–Franz number det. 329
    electrothermic refrigeration 330
    at superconductive/non-superconductive state junction 1066, 3533
    Fe single crystal, magnetization effect 1854
    Cu$_3$Au transformation process effect 1855
    Ni amalgams, irreversible transition 2612
    Ti single crystals, Seebeck effect 3526
    superconductors, empirical correlation 5423
    BaO and (Ba–Sr)O thermo-e.m.f. 5425
    Bi props 5426, 9498

Thermoelectricity—*contd.*
Ti coeffs. 5427
Te film properties 6218
fine-cryst. metal wires, Benedicks effect 6232
of Ge and PbS surfaces 6968
Se, props. 6975, 7878, 7886
Cr–S and Fe–S systems 7851
$(La, Sr)MnO_3$, props. 7866
white/grey Sn junction 7869
CdO and NiO 7880
αFe_2O_3, Seebeck coeffs. 8736
Peltier effect power generation appl. 8745
HgSe/Se solid soln., differential force 9468
suppression at very low temps. 9497
Thermometers see also *Pyrometers*; *Thermocouples*
gas, giving thermodynam. temp., theory 1810
thermistor with linear calibration 6180
Helsinki gas thermom. 7820
Ohio cryogenic lab., He thermom. 8699
resistance
resistances table, machine calc. 270
Pt on cellon glass, radiation effect 2198
in gaseous explosions study 2638
Pt high-temp. resist. 4377
thermistors in ultrasonic interferometry 6084
Pt, calibration 11°–90°K 7821
improved lead assembly 7822
hot-wire anemometer, gas streams appl. 8701
Thermonuclear reactions see also *Elements, origin*
lighter elements origin theory 2304
elements, origin (erratum) 2312
Li–Be–B process in variable stars 3299
in white dwarf stars 3301
Pu bomb shock-wave, nova eruption repres. 4054
search for He^3 in sun 6688
Li and sun's internal circulation 6689
electron pair creation and neutron formation 6716
H temp. raised suddenly by shock wave 6717
chemical ignition 8288
initiation by shock-wave collision 9347
Thermopiles
with high-sensitivity photocell compensation 2489
ocean wave meter appl. 3229
for i.r. spectrometer, vac. gauge appl. 4398
Thermostats
electronic, for high temps. 1023
for control to 0·0005°C 1812
temp. programme control 2640
temp.-controlled lab. furnace 3499
cryostat for 4–14°K 5362
low temp., dry ice 7823
cryostat for jet freezing deposits study 8702
Thickness measurement see also *Particle size*
films, simultaneously with optical const. 988–9
thin films, by Fabry–Perot interference 1767, 6899
films, phase-shift amplification 1768, 2580
with interferometer microscope 1785
radiation absorption methods 2403
thin films, 3 new interferometric methods 2575
transparent lamina, diffraction 2582
He II film 2629
new Leitz instr. 4125
thin films, multiple-beam interferometry 4305, 6895
thin film, by radioactive tracer condensation 5140
absorbing films, phase-change method 5311
metallic films, tables 5314–15
interferometry, accuracy 6144
alignment chart for evap. films 6496
metal wall, ultrasonic method 8540
banded spectrum interferometer 8661
X-ray method 9130
photographic emulsions, recording meter 9894
Thixotropy
elastic, in polyvinyl chloride 710
and electrical behaviour 711
thixotropic flow, mech. 3825
worker-consistometer 3870
particle shape in thixotropic suspensions 4857
secondary stresses in viscoelastic flow 9035
Thoria
optical emissivity 923
thermionic properties and activation 1145
cathodes, thermionic properties 1146
Thoria—*contd.*
cathode coatings, invest. 1147–8
cathodes, emissivity changes 1149
filament coatings, base-metal effect 1896
coatings, spectral emissivity 2491
semiconducting props. *in vacuo* 6215
as cathode emitter 7987
Thorium
detection in rocks 2936
Th content of thoriated W, radioactivity method 3181
neutron-autoradiographic det. in minerals 5807
survey of analysis methods 8324
evolution in Earth 9182
Thorium nitrate
electrophoresis and electrolysis, polarization 334
Thorium oxide
electrophoresis and electrolysis, polarization 334
Thorium sulphide
as thermionic emitter 1895
Thulium
isotopic constitution 1258
Thunderstorms see under *Lightning*
location, review 3965
effect on earth's electric field 3996
tape recording of field changes 7421
electricity distribution 9855
charge passing vertically to ground 9857
Tides
theoretical and observed, phase differences 821
propagation in estuaries and rivers 7593
wind tides in small channels 9307
Time interval measurement
frequency determination, review 61, 4069
1 msec recording chronograph 823
condenser chronograph 2405
10-channel time discriminator 3354
electronic chronographs 4025
solar eclipse contact times 6702
welder timing control 7579
electronic timer, 0·001 sec precision 7580
Time measurement
review article 61, 4069
automatic isochronism testing 2355
diurnal variations, explanations 4068
chronograph recording to 0·001 sec 5059
quartz clock data, definition of time 5060
cosmological time scale tests 5983
phase of earth's error 6010
atomic and pendulum clock, difference 8442
earth rotation, seasonal fluctuation 8483
clock paradox in relativity theory 9262
Tin
viscosity/temp. relationship 107
layers, optical properties 227
grey, electrical properties 313*, 1048, 3524–5
thermoelectromotive force at superconducting-normal junction 1066
de Haas–van Alphen effect 1176, 9601
white, single crystals, self-diffusion 1339, 9013
polycrystalline, self-diffusion 1340
film formation, electron microscope study 1349
white, mechanical twinning 1484
thermal conductivity at liq. He temps. 1794
isotopes, superconductivity 1850–1
crystal boundaries, energy 2077
tensile stressing after work-hardening 2101
superconducting, surface resist. meas. 2699
superconducting, mag. moments and eddy currents 2706
friction, 4°–600°K strength, hardness 3107, 6519
single-crystals growth 4894
grey, semiconductivity 7869
superconducting, penetration depth expt. 7903
superconducting, mag. field penetration 7909
abs. energy loss of 18 MeV protons 7956
superconductivity of isotopes 8742
transition to superconductivity 9486–7
Tin oxide
coated glass, resistance temp. coeff. 305
Titanium
H–Ti system invest. 2115
electrolytic micrographic study 3075
evaporation rate, emissivity 3484

Titanium—*contd.*
single crystals, electromag. props. 3526
gaseous, thermodynam. props. 4353
thermoelectricity, allotropic transformation 5427
Titanium carbide
heat of formation 7825
Titanium dioxide
semicond., technology 7891
Titanium nitride
heat of formation 7825
Titanium oxide
thin film, refractive index 2575
as interferometer beam divider 2579
optical absorption and photoconductivity 6855
Torsion see also *Elastic constants*
variation of elastic mod. 2089
oscillation, damping rel. to temp. 3851
magnetic suspensions oscillation, eq. 4176
suspension strip, torsion moment 5135
ferromag. wire oscillations, damping 6505
oscillating rods, surrounding medium damping 6813
torsional pendulum, shear modulus appl. 9745
Tracers see also *Radioactive tracers*; *Radiochemistry*
O^{18} in heterogeneous catalysis study 1398
catalytic research appl. 1405
D, liq. water structure and self-diffusion meas. 5160
C^{13}/C^{12} det. by i.r. absorption 7754
exchange of sorbed H_2O with D_2O 9759
Transducers see *Acoustic transducers*
Transformations, geometric
hodograph, for incompressible vortex flow 868
to speed convergence of series 3254
configurations of radiation field 3323
ocean wave refraction 3379
canonical, in arbitrary spin particle theory 4030
integral Lorentz, and discrete space-time 4073
Schwarz–Christoffel, appl. 4993
image diffraction defects correction 5321
infinitesimal canonical and unitary, corresp. 8495
homology space groups 8420
Transforms
Weyl's inequality 779
Laplace, eigenvalues det. 781
Laplace, in H atom matrix element calc. 857
Mellin, applications 1561
Laplace and Mellin, in showers cascade theory 1914
multiplication method for computer 2298
Fourier, of Dirac eq. 2380
Laplace, in Dirac's "variation of parameters" method 7558
Transmission
acoustic waves see also *Acoustic wave propagation*
transmission layers, conductivity 2465
through partition sample, meas. 4186
through steel plates in water 5184
impedance in energy-function terms 5197
ultrasonic
gelatinous subst., elastic const. det. 4793
electromagnetic waves see *Electromagnetic wave propagation*
light see also *Absorption, light*; *Filters, optical*
far i.r. investigns. 190
diffuse 208
thin films phase shift, interferometric meas. 228
macromolecule solns., spectrophotometric mol. wt. det. 709
optical glass, spectral distribution 762
quadripole theory appl. 986
semi-transparent films, optical constants det. 987
photographic objectives, stray light 1005
Hg vapours, resonance radiation at h.p. 1733
near i.r. by glasses, analysis 1761
abatement coeff. var. in suspensions 2584
i.r., in turbid atmosphere 3987
atmospheric, 1- to 14-μ region 3988
and i.r. radiations, through fog 4946
prism transmittance 5234
CsBr crystals, transmittance 5266
near total reflection angle 5307
metallic films, tables 5314–15
Ag films 5316–17
meas. of small samples 6118
galena, infra-red 6858

Transmission—*contd.*
light—*contd.*
microscope with coated optics 6915
Na silicate soln. invest. 7353
spectral distrib., low intensity meas. 7656
metal films on non-absorbing backing 8657
Se single crystals 9361
Transparency see also *Transmission*
optical glass, spectral energy distrib. 762
glasses, near i.r. 1761
ice, 300 to 1 300 mμ 3964
glasses, u.v. absorption spectra 8637
glass transparent to X-rays 9887
Tritium
radioactivity meas. in solid samples 563
content of atmosphere 761
T + D reaction, theory 1622
T(d, n)He^4, 90° cross-section 2042
T(d, n)He^4, ang. distrib. 2043
hyperfine structure 2926
quantitative meas. by counting 3718
occurrence in nature 6396
CH_4^3 counting assay 7201
beta-ray spectrum 8165
Tritons see also *Nuclear reactions, tritons*
binding energy 1618, 3032, 3697
magnetic moment anomaly, T h.f.s. study 2926
14-MeV neutron scattering 3037
range-energy, rel. to emulsion composition 3581
from d on Be, ang. yield 5757
2·7 MeV, range in minerals 5781
range in emulsions 7957
Tungsten see *Wolfram*
Tuning forks
in audiofrequency filter 1682
elastomers dynamic shear props., resonance method 3819
Turbulence see also *Cavitation*; *Vortices*
in streaming birefringence apparatus 112
homogeneous, diffusion in 124
experimental test of Heisenberg's theory 1644
isotropic, in magneto-hydrodynamics 1646
spectrum, quantum-theory method 2453, 6076,* 8548
in gaseous electric conductors 3529
in 2- and 3-dimensional fluids 4145
isotropic, pressure fluctuations 5146
homogeneous, space and time correl. 6771
isotropic in magneto-hydrodynamics, invariant theory 6774
in thermal diff. columns 6780
modified law of decay, equilibrium and similarity spectra 7589
non-homogeneous, statist. theory 7590
fine-scale structure 8547
passage through gauze 9300
turbulons interaction 9302
aerodynamics
axisymmetric, decay 133
turbulent wake of cylinder 136
hot-wire anemometer invest. 894, 1660, 5147
triple velocity correlations 1657
homogeneous, correlation problem 2454
interstellar medium 3270
atmospheric, meas., review 3965
atmospheric, duct formation 4005
isotropic temp. fluct. spectrum 4170
isotropic, spectral components decay 4171
isotropic, similarity and self-preservation 5145
circulation near vibrating reed 6086
3-dimensional flow, complete forms 7614
production by flames, theory 5355
hot-wire anemometer, constr. 8583
effect on flame propag., gases 8692
mist-water interface boundary conditions 6778–9
lateral, in atmos. 6637
upper atmos. 6638
hydrodynamics
laminar flow transition 1643
pressure-velocity correl. 5148
new vorticity transfer theory 7591
jet, effect on atomization 8550
in 2-dimensional channel 9299

A complete list of the Subject Headings will be found at the end of the Index.

Twilight
higher layer temp. from twilight arc 2211
airglow studies, progress 2220
secondary dispersion theory 3236
discontinuities observations 3237
photometric observations 4917
atmos. optical sounding 6649
spectrum, review 7420
earth shadow study 8381–2
photometer for Na *D*-line study 8384
Ultracentrifuges see *Centrifuges*
Ultrasonics see also separate headings, e.g. *Absorption*
alkali halide soln. study 116
production by electrostriction 156
making waves visible 160
ultrasonic soldering irons 161, 2477
fields in fluids, meas. 163
l.f., propagn. in rubbers 165
illumination of phosphors 219
light diffraction 234
piezo-electric crystals devel. and appl. 302
elastic constants determination 302, 668, 1362, 3089
water flow velocity measurement 1645
medical diagnostic possibilities 1677
underwater point-source probe 1679
non-temperature effects on living systems 1684
intracranial pathology detection 2266
quartz vibrators, applications (book) 2459
projector design 2471
pulse meas. of Debye effect 2476
gel studies 3151–2, 9080
magnetostrictive production in transformers 3413
technique, textbook 3415
aeroplane detection; insecticidal siren 3416
effect on diffusion, liquids 4153
ultrasonography 4179
fundamentals, textbook 4180
volume magnetostriction generation 5201
outlining cerebral ventricles appl. 5208
lamination detection equip. 5209
bibliography (1926–50) 6088
supersonic field of flow invest. 7615
in biology, biochemistry and biophysics, bibliography (1900–50) 7637
gels elastic constants det. 8262–3, 9080
metal wall thickness meas. 8540
hemolysis and cavitation, human blood 8601
cause of liq. viscosity local differences 9317
Debye effect in solutions 9502
Uncertainty see *Indeterminacy*; *Probability*
Units see also *Constants*; *Dimensions*
ionizing particles, dosimetry 771
dosage, for high-energy radiations 2725
radiological, internat. recommendations 3554, 9877
γ-unit at 320 and 160 MeV 4630
of wave number 4070, 6014, 7500
time, definition 5060
physical concepts system, structure 6720
decibel, conception and dimensional anal. 6815
radioactivity, history 7199
fundamental and derived quantities 8491
classification, review 9255
natural atomistic system 9256
adsorption, the "gibbs" 9792
Units, electrical
electromagnetic, rational and non-rational 513–4
magnetic, definition discussed 1171
Faraday det., new method 1814
rationalized M.K.S. 6719
fundamental and derived quantities 8491
dimensions of elec. and mag. quantities 8492
classification, review 9255
rationalization problem, electrodynamics 9608
Uranium
magnetic susceptibility 1180
ions, exchange reactions in solution 1389
glasses, photoluminescence interpretation 2553
detection in rocks 2936
examination under polarized light 4302
ter- and quadri-valent, halides, magnetochem. 4535
neutron-autoradiographic det. in minerals 5807
analysis in solution by X-rays 8330
evolution in Earth 9182
Uranium chloride
magnetic susceptibility 7100
Uranium hydride
H positions by neutron diffraction 9838
Vacuum apparatus see also *Glass-metal seals*
packless regulator valve 130
high-temp., high-vacuum furnace 258
industrial leak detectors 880
review conference 881
cloud chamber press. stabilizing device 3593
greaseless flow valve 4164
furnace for single crystals 4878
cold trap anti-icing shield 6783
simple screw up glass-metal seal 6785
high-vac. automatic press. control 7609, 9330
valve for very pure gases handling 7610
for oil degassing, etc. 7611
greaseless gas-handling system 9103
mass spectrometer leak detector 9331
mass spectrometer ion source 9540
Vacuum gauges
review conference 881
Pirani safety circuit 2438
electrical methods for high vacua 2439, 3394
ionization, aux. equip. 2440
triode ionization gauge invest. 3596
i.r. spectrometer thermopile appl. 4398
discharge tube meter 6074
low pressure estimation by counting gas impacts 8575
ionization, calibration for H, N, O, CO, CO$_2$, H$_2$O 8576
heat conduction 8679–80
Philips type, as ion source 9540
Vacuum pumps
review conference 881
sliding-vane, speed meas. 882
vapour flow in diffusion pump 883
molecular, design calc. 2441
ionization type 3393
fractionating oil diffusion, best conditions 4163
fractionation, reverse separation 4165
oil diffusion, high-speed baffle 6784
silicone oil diff., effect on electron emission 7019
automatic press. control 9330
Vacuum technique
rubber, Teflon, vinylacetate and Pb gaskets tests 129
review conference 881
flow formulae, tubes 2437
thin films production, review 4781
Ba getters, efficiency, mechanism 6786
differential leak detection 7612
Vacuum tubes see *Electron tubes*
Valency
molecular orbitals theory 534
actinide *f*-shell covalency 1457
CH, CH$_2$ and CH$_3$ vibrations, harmonics 1734
intermetallic compds., electron transfer 1958
directed, in IF$_5$ and IF$_7$ 2146
molecular structure as equiv. orbitals 3684
molecular orbital theory, ionisation pot. calc. 3685
of Mn in Mn dioxides 4864
orbitals derivable by sp_3 hybridization 5650
water transformation from covalent to electrovalent combination 5885
Coulomb and exchange integrals calc., polar structures 5886
covalency, electrovalency and electronegativity 6379
forced hybridization 7169
microwave spectroscopy det. 7744
free valence defn. on Penney bond orders basis 8086
C and Si tetrafluorides, force fields 8090
transition elements in metallic state 9092
free valence in unsat. hydrocarbons 9093
directed, eigenfunctions in hybridization pure form 9793
Valves see *Electron tubes*
Vanadium
superconductivity 320
Vanadium oxide
specific heat 8705

Vaporization see also *Boiling point*; *Condensation*; *Distillation*; *Evaporation*; *Heat of vaporization*; *Thermal transformations*; *Vapour pressure*
- velocity, effect of vaporization cooling 255
- SrO 2608
- entropy, 53 liquids 2650
- contam. of Au by W oxides 3070
- rhombic S, rate 3483
- titanium 3484
- hydrocarbons and fluorocarbons, characteristics 3486
- rate, rel. to vap. press. 3489

Vapour density see *Density, gases*

Vapour pressure see also *Humidity*; *Vaporization*
- wind-tunnel and jet-engine gases 252
- H, b.p. to critical point 256
- liquid N 257
- He^3, He^4 solutions 267, 9428
- over curved surfaces 708
- H_2, HD, D_2 mixtures, individual components 878
- discontinuities, molec. aggregation theory 1648
- liquid He^3, 1·025° to 3·35°K 1805
- Kr, Xe 2435
- SrO 2608
- phase relations calc. 3111
- rhombic S 3483
- ortho-deuterium, 13·1–23·6°K 3485
- hydrocarbons and fluorocarbons 3486
- Ta, 2 624–2 943°K 3487
- Zr, 1 949–2 054°K 3488
- rel. to evap. rate 3489
- 6 H isotopic molecules 4333
- H, D and T up to 3 atm. 5353
- Zn, 300–360°C 6171
- neopentane 6923
- variation with external press., invest. 7623
- small droplets 8586
- liquid He at λ-point 8698

Vapour pressure measurement
- atmosphere, sensitive recorder 3969
- Hg, 40°C to 240°C, streaming method 4334
- Br 4337
- by matched thermistors 6170
- low, by mass spectrom 9421

Variable stars see also *Astronomical spectra*
- and red giants, pulsation problem 49
- physical processes 3299
- classical Cepheid, magnitudes and colours 5037
- supergiant, red, in S.M.C. 5042
- Cepheids luminosity-velocity rel. 5047

Variational calculus see *Calculus, variational*

Vectors
- elastic body deformation 3813
- computor for eigenvector det. 4038
- differential eq. representation 5972
- Brouwer's theorem applications 7445

Velocity
- bar-magnet meter 7581
- **acoustic waves** see also *Liquid helium, sound propagation*; *Shock waves*
  - in compressibility temp. coeff. det. 105
  - in rarefied He 145
  - pulse propagation 149
  - in wind tunnel and jet-engine gases 252
  - in superconductivity theory 325
  - in glass 685, 3103*
  - in metals 903
  - rel. to 2nd sound velocity, 0°K 1017, 3497
  - rel. to shadow zone in ocean acoustics 1680
  - as measure of absorption 1706
  - in CO_2 near critical point 6799
  - rel. to v.p. curve and Cv at critical point 6939
  - in heterogeneous matl., det. 7628
  - hydrocarbons, rel. to mol. vol. and dipole mom. 9312–15
  - **ultrasonic**
    - in organic solutions 117, 3409, 7635
    - acetylene derivs., structure invest. 118
    - in rubber and rubber-like polymers 165
    - in He, − 78°C to 200°C, rel. to press. 902
    - in gases, interferometric det. 905, 5178
    - in critical temp. region 907
    - in liquid S, 12 Mc/s 908

Velocity—*contd.*
- **acoustic waves**—*contd.*
  - **ultrasonic**—*contd.*
    - in liquid metals 909
    - in Ni, magnetic field effect 911
    - measurement in liquids 914, 2463
    - dispersion in liquid fatty acids 1671
    - in organic vapours 1672
    - in animal tissues 1677
    - solvation measurement 2431
    - dispersion in liquid higher fatty acids 2464
    - measurement methods 3415, 4182
    - SF_6 crit. temp. region 4183
    - meas. in liquids, low temp. 4213
    - in alcohols, temp. dependence 5179
    - in seawater 5180
    - in ideal liquid mixtures 6065
    - benzene vapour, dispersion 6078
    - light diffraction, theory 6148
    - longitudinal and shear, optical method 6800
    - dispersion in N 6805
    - Ni single cryst., magnetization effect 7636
    - in organic liquids 8595
    - solutions, effect of electrolysis 9316
    - in liquids, review 9342
- **light**
  - optical radar surveying system 862
  - resonant cavity method 1710–11
  - proposed new value 4219
  - most probable value, est. 8608
  - reflection from moving mirrors 8609

Vibrating bodies see also *Crystals, lattice dynamics*; *Elastic waves*; *Pendulums*; *Piezoelectric oscillations*; *Tuning forks*
- non-uniform beams, matrix soln. 141
- non-conservative, variable-mass system 900
- wood, vibrational props. 2090
- quartz, theory, applications, manufacture (book) 2459
- elastic cables 3349
- steel rods, characteristic freq. 4177
- organ flue pipe voicing 4206
- uniform thin fixed-free bar 5173
- contour modes of square plates 5174
- air circulation near reed 6086
- coupled system, freq. stabilization appl. 7625
- almost cubic parallelepipeds 9341
- plates, sound absorption 9349–50

Vibrations see also *Acoustics*; *Damping*; *Oscillations*; *Vibrating bodies*; *Waves*
- search-tone analysis 913
- closed spaces, elastic walls 2458
- relaxation absorption in β-brass 2466
- forced vib. system, graphical soln. 4032
- acoustics textbook 4180
- effects on crystal X-ray diffraction 4208
- conditional stationary Laplace functions 4994
- mechanical transformers 6797
- torsional, flexural and stretching; damping invest. 6813
- graphical method for single-degree problems 7624
- resonances in water-filled pipes 8589
- **excitation**
  - accelerometers, transient response 2406
  - parametric, analysis 2460–1
  - generation of striations 3202
  - fluid sphere, brain injuries invest. 4016
  - prolate spheroids, magnetostriction 4567
  - elastic system, multiple excitation 5175
  - electrochemical ground wave source 5935
  - in flat speaking tube 6794
  - reed forced vibrations in viscoelasticity det. 7318
  - growth of waves on helical spring 8602
  - bar, under longitudinal impact of elastic load 9340
- **measurement** see also *Seismographs*
  - electronic vibration meter 144
  - interferometric method 4305, 6080, 6895, 8590, 9396
  - interferometer-stroboscope 3407
  - pick-ups, reciprocity formula 3408
  - damping capacity meas., circuit 5824
  - bar-magnet meter 7581
  - recorder, shock waves, etc., appl. 7626

Viruses
- size, shape, hydration 7426

A complete list of the Subject Headings will be found at the end of the Index.

Viscosimeters
  non-Newtonian liquids, capillary meas. 110–11
  for suspensions 2409
  12 types, design details 3358
  rotating cylinder 3359
  for drilling muds 4139
  fluorescent-screen recording apparatus 4987
  for use up to 3000 atmos. 5142
  capacitance-change type 5143
  for oil layer study 6770
  pseudoplastic flow props. meas. 9295
Viscosity
  temp.-dependence factor in porous medium convection 254
  glass, temp./viscosity rel., rate-process theory 684
  intrinsic, of nitrocelluloses, rel. to mol. wt. 727
  in plastic bodies 1372
  rough powder suspensions 2408
  visco-elastic behaviour 3094–5
  elastomers, meas. 3819
  solids, rel. to internal friction 3851
  liquids and polymers, rel. to therm. conduct. 4327
  conc. polymer solutions 6054–5
  variable-viscosity, compressible fluid, sound-wave propag. 7586
 gases
  unsteady laminar flow 131
  wind-tunnel and jet-engine gases 252
  He 277
  S vapour 1655
  organic vapours 3391
  bulk, phenomenological theories 4162
  He^3 5171
  He, A, H_2, O_2, N_2, CO, CO_2, H_2O, air 7607
  simultaneous heat and mass transfer 8573
 liquids see also *Lubrication*; *Superfluidity*
  metallic, temp. relationships 107
  concn. dependence in solns. 108
  molten metals, det. 109
  non-Newtonian liquids capillary meas. 110–11
  alkali halide solutions 116
  lubricants 866
  long-chain molecules in soln. 1437
  intrinsic, polystyrene in soln. 1439
  electric field effect 1637
  organic, mol. wt. 120–807 1638
  rel. to previous history 1639
  at high shear rates 1640
  temp. dependence 1641, 4138
  discontinuities, molec. aggregation theory 1648
  liquid He 1806, 9427*
  surface tangential stress, rel. to viscosity coeff. 2420
  hydrodynam. lubrication theory 3363
  redn. at high shear rates 3364
  elastic dispersions 3365
  transport processes, recent theory 3384
  lubricating oils, rel. to scuffing temp. 3837
  lubricating oils at high shear rates 3843
  hydrocarbon mixtures 4142
  rod-like macromolecules solns., visco-elastic props. 4137
  distribution function in phase space 4148
  volume viscoelasticity from acoustic phenomena 4192
  methyl siloxanes, press. effect on melting 4335
  liq. He, oscillating disk method 4341
  high polymer solns., rel. to mol. wt. 4872–3
  high polymer solns., rel. to conc. 4874
  at const. vol. varying temp. 5142
  rel. to gas evolution and solution rate 5162
  macromol. solns., conc. dependence 5163
  suspensions of spheres, dia. effect 6769
  grain boundaries, theory 7303
  high polymers, viscoelasticity 7316
  Na silicate soln., light-scattering invest. 7353
  binary mixtures, theory 7584
  temp. dependence in Newtonian flow 7587
  eq. of motion, exact solutions 7588
  rel. to heat conductivity 8543
  conc. suspension spherical particles 9074
  sarcosine polymers, aq. soln. 9098
  theories, ionic liq. appl. 9293
  local var. due to ultrasonic radiations 9317
Viscosity—*contd.*
 liquids—*contd.*
  viscosity/temp. discontinuities, supercooled ionic melts 9323
  organic liquids, ultrasonic absorpt. invest. 8595
Visibility
  measurements, review 3965
  turbid atmosphere, i.r. 3987
  rel. to atmospheric i.r. transmission 3988
  in fog 4946
Vision see also *Colour vision*; *Stereoscopy*
  resolution of double stars 769
  eye's geometric aberration 1551
  effects of polarized light 2242
  star scintillation recording 2251
  dark adaptation, pre-exposure studies 2252, 4962
  glare and adaptation 2253
  metric of binocular visual space 2254
  information theory conference 2482
  peripheral contrast thresholds 3242
  binocular eye movements at high convergence 3244
  acuity with various sun glass types 4961
  dark adaptation level, rel. to testflash time 4963
  suprathreshold area brightness relationships 4964
  comfortable brightness relationships 4965
  visual acuity and accomm. microfluctuations 4966
  microfluctuations influence on retinal image 4967
  spherical and chromatic errors and resolving power 4968
  night myopia 4969
  adaptation, factors affecting 5949
  role of convergence in stereoscopy 5950
  dark adaptation, nervous or chemical mechanism? 6659
  dark adaptation time after stimulus 6660
  "physiological" magnification of optical instruments 6908
  critical flicker freq. decrease with age 7428
  quanta and visual thresholds 7429
  flicker fusion freq. meas. 8391
  acuity and normal tremor 8392
  diffraction in the eye 9869
  visual power and visibility 9871
  resolving power from energy viewpoint 9872
  ocular scanning and depth perception 9873
Vitreous state
  breaking strength, rate-process theory appl. 683
  temp.-viscosity rel., rate-process theory 684
  structural birefringence 995
  Na_2O–SiO_2 glasses structure 2076
  visco-elastic theory 3094–5
  glycerin, ultrasonic absorpt. 4190
  specific heat 4351
Vortices see also *Cavitation*; *Turbulence*
  incompressible fluid, variational principle appl. 2411
  stability theory 3366
  Ertel's theorem 6058, 8552
  new vorticity transfer theory 7591
  turbulons interaction 9302
Water see also *Seawater*
  limiting hydrostatic tension near 0°c 106
  surface tension temp. dependence 2421
  theory of structure 2433, 3383
  heavy water, mass spectrometer det. 3184
  supercooled, freezing nuclei function 3386
  diel. const. and saturation effect 4366
  liq., self-diffusion and structure, D tracer meas. 5160
  near-i.r. absorption spectrum 5274
  of crystallization and adsorption, 3·15-cm wave absorption 5613
  adsorbed, kilometric waves absorption 5614
  stopping power for α-rays 5712
  transformation from covalent to electrovalent combination 5885
  dielectric permittivity 6199
  air-coupled, flexural, in ice sheet 6793
  heavy, density and molec. vol., 20°–100°c 7585
  heat conduct. and viscosity data 7607
  chem. effect of ionizing radiations 8306
  adsorbed on silica, dielectric behaviour 8312
  dielectric properties mixed with dioxan 8718–9
  supercooled, freezing 9420

A complete list of the Subject Headings will be found at the end of the Index.

- **Water**—*contd.*
  - D_2O spectra analysis 9633
  - natural, radioactivity 9647
  - decomp. by α-rays 9773
- **Water vapour** see also *Humidity*; *Steam*
  - diel. const. at 9 400 Mc/s 291
  - refractive index calc. 1715
  - condensation in shock waves 3490
  - 2nd virial coeff. 4571
  - diffusivity in common gases 5166
  - influence on night sky luminescence 9852
- **Wave mechanics** see *Quantum theory, wave mechanics*
- **Waveguides** see *Electromagnetic wave propagation, waveguides*
- **Waves** see also *Acoustic waves*; *Elastic waves*; *Electromagnetic waves*; *Liquid waves*; *Seismic waves*; *Shock waves*
  - higher order equations soln. 782
  - anisotropic propagation 1667, 5176
  - superposition principle limitations 1765
  - magneto-hydrodynamic, in ionized gas 1944
  - magneto-hydrodynamic shocks 1945
  - gravity, radiation friction 3350
  - Rayleigh, in 2-layer heterogeneous medium 3951
  - wave-number unit 4070, 6014
  - material waves, quantum theory review 4111
  - plane, scattering by soft spheres 4312
  - wavefields representation 5597
  - in inhomogeneous wave filters 6079
  - waveform anal., time and freq. uncertainty 8434
  - 2-dimensional, ray-particle analogy 8555
  - velocity of energy propagation 8591
  - propagation in one-dimensional structures 8871
  - interaction of compression and expansion 9345
  - theorem on focusing in absorbing medium 9357
- **Weather forecasting**
  - main weather features, progress review 2217
- **Weighing** see also *Balances*; *Mass standards*
  - precision, chem. balance adaptation 9292
- **Wetting** see also *Contact angle*; *Heat of wetting*
  - polytetrafluoroethylene 3380
  - hysteresis, drop and bubble stability 3381
  - as adherence phenomenon 3833
  - influence of liq. surface tension 7600
  - det. of surface tension of solids 8559
  - causes of "liquostriction" of solids 8560
- **Wind**
  - velocity and direction, electrical meas. 759
  - wind- and gust-measuring instruments 760, 9196
  - upper air, meteor study 763
  - true velocity on ship, electrical method 1533, 9197
  - wind-run analyser 2195, 9191
  - upper wind meas., radar-sonde 2196, 9192
  - mean-wind-velocity instr. for ships 2199, 9198
  - jet stream, geostrophic departures 2208
  - hydrodynamic stability theory 3366
  - energy transfer to wave 3375
  - measurements, review 3965
  - formation of water waves 5167
  - upper atmos. 6638
  - wind tides in small channels 9307
- **Wolfram**
  - heated spiral life and evapn. rate 408
  - Ba oxide on W, cathode, interface 4490–1
  - incandescent, brightness standard 5227
  - ribbon lamp, photographic calibration 5365
  - Pt-coated, thermionic emission 5508
  - absolute spectral emissivity 7657
  - evap. film, elec. cond. 7887
  - overlap forces and elast. const. 8084
  - spot-welding 0·005 mm wire 8583
  - effect of deformation on elec. resistivity 9496
  - X-ray spectra 9512
- **Wolfram carbide**
  - frictional properties 4808
  - for X-ray mirrors 7002
- **Wolfram oxide**
  - domain structure 2672, 6201
  - contam. of Au films 3070
  - phase transition 6585
  - ferroelectric Curie point 6949
- **Wood**
  - dielectrical anisotropy 286
- **Work function** see also *Electron emission*
  - oxidation and corrosion of metals 1032
  - thoria-coated cathodes 1147–8
  - cathode, correction in X-ray *h*/*e* evaluation 2357
  - clean Ta, and Th on Ta 2776
  - cathode, effect on spark pot. 6235
  - extraction of electrons from metals by neutral gas molecules 7017
  - Ge impurity centres 7883
- **Work hardening** see also *Cold working*; *Surface texture*
  - effective stress and strain rel. to plasticity theory 681
  - effect on diaphragm bulge shape 1371
  - Al, density variations 1375
  - effect on plastic deformation 2101
  - Fe ingots, low temp., factors affecting 2105
  - Fredrickson–Eyring theory error 2106
  - review of fundamentals 3829
  - cold work, effect on elec. conductivity 5402
  - widened lattice interval 6486
  - plasticine 6518
  - metal physics progress 7439
  - plasticity theory extensions 8264
  - mild steel by explosive attack 9031
  - metals, dislocation theory 9748
  - steel, grain-boundary theory 9750
- **X-ray absorption** see also *X-ray spectra*
  - thickness meas. 2403, 9130
  - supersonic flow density meas. 2450
  - correction, encased diffracters 3203
  - in crystals at Bragg angle 3553, 9821
  - Ge, absolute coeff. 5451
  - edges on powder photographs 6572
  - 280-MeV 8178
  - analysis of S in petroleum 8329
  - analysis of U in solution 8330
  - low-energy, by nuclei 8978
  - abnormally small, Bragg case 9820
- **X-ray crystallography**
  - position of powder maxima with Geiger counter spectrometer 2168
  - particle size and diffracted power 2169
  - geometry effect on Debye–Scherrer lines 3201
  - encased diffracters, absorption correction 3203
  - absorption at Bragg angle 3553, 9821
  - rutile structure comparisons 3918
  - effect of vibrations on patterns 4208
  - new meas. in metallography 4785
  - divergent beam, Debye–Scherrer lines, absorption effect 4906
  - progress survey 5910
  - large crystal oscill. phot., missing reflections 5914
  - standard patterns 5918
  - micro-beam, high intensity generator 6252
  - transmission through many layers, resultant effect 6999
  - dolomite thermal decomp. study 7391
  - metal physics progress 7439
  - hydrocarbon analysis by powder patterns 8331
  - Cr atomic scattering factor curve 8762
  - abnormal penetration in Bragg case 9820
  - **analytical apparatus**
    - Fourier summation machine 9
    - mechanical structure-factor calc. machine 751
    - Fourier synthesis analogue apparatus 1496
    - structure factor sliderule 3920
    - Fourier synthesis summation, optical method 5002
    - photoelec. structure-factor machine 6576
    - structure amplitudes, calc. machine 8351
    - optical machine in Fourier series calc. 8352
    - multiple projector for Huggins masks 7389
    - Fourier transforms appl., optical 9141
    - Fourier synthesis by opt. interference 9142
    - using Patterson maps 9827
    - reproducible Huggins-type masks 9826
  - **analytical methods**
    - beryl parameters by partial projections 750
    - atomic coordinates, vector repres. method 1493
    - probability dist. of intensities, class and space group det. 1494
    - space groups vector representation tables 1495
    - apatite *c*/*a* det. 1511
    - rotating crystal, modified Lorentz factor 2170
    - limits of accuracy 2171

A complete list of the Subject Headings will be found at the end of the Index.

- **X-ray crystallography**—*contd.*
  - **analytical methods**—*contd.*
    - dibenzyl electron-density maps accuracy 2172
    - 1-dim. crystal, punched-card 2173
    - Patterson, vector convergence 2174
    - Patterson function electron density limitation 3206
    - structure rel. to symmetrized Patterson function 3207
    - lattice sums for ionic crystals 3195
    - rotation factor correction 3917
    - soln. of structure factor eqns. 3921
    - "sub-cell" structure factors 3922
    - Patterson functions maxima 3923
    - sheet-range order, Ag–Au 4784
    - punched cards appl., temperature factor 4905
    - intensities variance 5915
    - Fourier synthesis, charge distribution invest. 5916
    - struct. det. without Fourier coeff. phases 5917
    - powder photographs, "spottiness" interpretation 6573
    - latt. const. from powder data, Cohen procedure modifn. 6574
    - Lorentz factor for rotating-crystal photographs 6575
    - Harker–Kasper inequalities forbidden reflections 6577
    - diffract. angles conversion to spacing, table 6578
    - optical methods in imperfect structures study 6579
    - strychnine, Fourier synthesis 6598
    - phase-limiting rel. from electron density max. 7388
    - Patterson transforms, fibres appl. 7390
    - steepest descents, simplified method 8350
    - Patterson function contrast increase 8353
    - multiplicity of solutions 9135
    - structures in disordered layers 9136
    - structure factor calc. by Fourier summation 9137
    - convergence, error, in non-centrosymm. structures 9138
    - $(F_0–F_c)$ synthesis 9139
    - Fourier synthesis, effects due to weak reflections 9140
    - Fourier transforms appl., optical methods 9141
    - tourmaline struct., Fourier-synthesis version 9159
    - space group symmetry 9806
    - vectorial complex expressions 9818
    - spherical Patterson sections 9828
  - **apparatus**
    - Geiger-counter spectrometer, crystal orientation 2164
    - diamond bomb for h.p. powder pictures 2167
    - triple-tube combination 2724
    - high-temp. camera for solid state reactions 3199
    - camera for direct reciprocal lattice recording 3200
    - Bragg–Brentano method with sealed fine-focus tube 3916
    - bent-crystal technique 4419
    - demountable-tube installation 4903
    - equi-inclination Weissenberg goniometer 5911, 8349
    - low-temp. device 5912
    - micro-beam collimation 6251
    - G.M. counter spectrometer, recording system 7000
    - direct-reading microdensitometer 7386
    - spectrometer, automatic focusing condition 8347
    - X-ray optics with cryst. reflection 9133
    - chart for setting Buerger precession camera 9822
    - new Jong–Bouman camera 9823
  - **structures** see *Crystal structure, molecular*
  - **technique**
    - powder diffraction, single wavelength X-rays 360
    - ZnO lattice constants det. 1502
    - strain-free metal cutting 1553
    - crystal orientation on Geiger-counter spectrometer 2164
    - crystal setting from zero layer curve photos 2165
    - crystals nuclear spot invest. 2166
    - powder striations formation method 3202
    - stationary crystal polychromatic exposures 3204
    - precision lattice-parameter meas. 3205
    - polycrystalline matl., X-ray flash tube appl. 3913
    - volatile or deliquescent crystals 3914
    - powder patterns of microsamples 3915
    - heavy atoms position det. 3919
    - new method for crystal imperfections study 5913
    - KCl–RbCl studies 6581
    - optical methods 7385
    - microcrystal analysis 7387
- **X-ray crystallography**—*contd.*
  - **technique**—*contd.*
    - meas. of thickness of surface layers 9130
    - X-ray optics with cryst. reflection 9133
    - back-reflection photographs, diffraction spots scatte 9134
    - monochromatic, small-angle scattering study 9824
    - new method for Compton and incoherent X-ray scatt. observation 9825
- **X-ray diffraction**
  - particle size and diffracted power 2169
  - complex mol. and ion structure det. in soln. 2907
  - periodically distorted fibrils 3077
  - encased diffracters, absorption correction 3203
  - graphite, anomalous intensities 3208
  - atomic, alloys 3210
  - crystals, effect of vibrations 4208
  - G.M. counters appl. 4415
  - ethyl alcohol and benzene study 4786
  - back-reflection spots 6571
  - absorption edges on powder photographs 6572
  - tables for conversion of angles to spacing 6578
  - X-ray shadow microscope 7930
  - high-brilliance tubes 7913
  - oxide cathode study 8808
  - diffraction spots scatter on back-reflection photographs 9134
  - by structures in disordered layers 9136
  - saw angle setting in crystal manufacture 9819
- **X-ray examination of materials** see also *Chemical analysis, X-ray; Radiography*
  - thermal expansion meas. discrepancies 2605
  - high-intensity beams, appl. 2722
  - elastic limit, surface and body 3100
  - stress meas., symposium 3814
  - **liquids**
    - absorption correction 3203
    - atomic distrib. function 4151
    - ethyl alcohol and benzene 4786
    - benzene, var. with temp. 8251
  - **microstructure**
    - clay minerals 1352
    - silica gel study 1353
    - deformed metallic grain 2100
    - latex particle size meas. 3076
    - collagen, periodic imperfections 3077
    - electrodeposits of metal on Zn 3078
    - Al plastic deformation 3803
    - yielding resist., effect of free surface 4803
    - disordered binary alloys 5819
    - amorphous Ge 5820
    - changes in metal structure at melting pt. 6226
    - metal surface-layer under electric discharge 8249
    - technique for sub-structures study 8250
    - fatigue in metals 8271
    - microbeam exploration 8348
    - deformed metals, line source method 9017
    - meas. of dia. of small spheres 9020
  - **molecular structure** see also *Crystal structure*
    - Ni–Co alloys 749
    - U–Fe alloys 774
    - solid Cu_3Au, local order 1356
    - PbS films 2084
    - order formation in $CdMg_3$ 3068
    - ramie and jute 3079
    - Cu–Zn alloys 3210
    - short-range order, Ag–Au 4784
    - long-range order, β Ag–Zn 5922
    - size, shape, hydration of viruses 7426
    - chitin 7732
    - polypeptide chain configuration 8362
    - Cu–Ni–Fe alloys, modulated structures 9018
    - long-range order in Ni_3Mn 9019
    - magnetite, structure transition 9596
    - Al_2O_3 films, orientation 9741
    - hydrous oxides and hydroxides 9783
- **X-ray measurement**
  - calibrated film badge dosimeter 361
  - Greenockite (CdS) detector 390
  - by chemical effect 706, 4631
  - 1 000 kV, Be-window equipt. tests 1090
  - long beaded counters 1122
  - ion chamber methods, review 1123, 4464–5

X-ray measurement—*contd.*
- absorbed energy, with cavity ionization chamber 1880
- units, international recommendations 2725, 3554, 9877
- photographic quality indicator and dose meter 2726
- 20 MeV, biol. evaluation 3246
- wide energy range, review 3555
- with NaI(Tl) counters 3591, 7217
- wavelength distrib. at point in scatt. medium 4416
- γ-unit at 320 and 160 MeV 4630
- radiation from h.f.-excited As vapour 5448
- integrating dosemeter 5453
- X-ray counters, theoret. eff. 5486
- survey of techniques 5684
- photographic film monitoring 5957
- dosage unit, theoretical considerations 6253
- improved G.M. counter meter 7963
- half-value-layer meter 8765
- energy flux, calorimetric method, 22·5 MeV 8766
- scintillation counter 8799
- 22-MeV cancer treatment, "build-up" meas. 9880
- dosage est. in radiotherapy, review 9885
- dosage est. in fields of any size and shape 9886

X-ray monochromators
- conference report 2722
- for powder camera 4414
- bent-crystal technique 4419
- curved-crystal, focusing 9133

X-ray reflection
- microscope, curved mirrors 7002
- technique for sub-structures study 8250
- meas. of surface layers 9130
- diffuse, det. of elastic consts. of crystals 9131–2

X-ray scattering see also *Compton effect*
- low-angle, review of theory 1087
- low-angle, by mineral colloids 1088
- protein molecules in soln. 1227, 6655
- by adsorbates on SiO$_2$ gel 1353
- diffusion by precipitation-hardening alloys 1354
- catalyst dispersion study 1401–2
- from hindered rotator 1491
- incoherent, in insulator 1492
- diffuse, and by H atoms 2722
- small-angle, by N 2723
- by ideal paracrystal 3198
- diffuse, by plastically deformed Al 3803
- elastic consts. of zincblende 3820
- low-angle colloidal Au and C 3869
- wavelength distrib. det. at point 4416
- coherent, by atoms, electron shielding 4417
- new type, exptl. verification 4907
- diffuse, by disordered binary alloys 5819
- diffuse, for ageing alloys, intensity calc. 6570
- fibres, Patterson transforms appl. 7390
- penetration, diffusion in ∞ homog. medium 7929
- Cr atomic factor 8762
- by fluids, theory 8763–4
- small-angle, particle meas. by 9020
- diffuse, from Au–Ni alloys 9736
- incoherent, in crystals, observation method 9825

X-ray spectra see also *Chemical analysis, X-ray*
- alkali halide, luminescence 222
- wavelength dist. det. absorption method 1086
- Ge hydrides and halides, *K* fine structure 5451
- fine structure, temp. dependence 7928
- Hg, W 9512
- **absorption**
  - chem. compds. and alloys, soft *K*-valence band 1866
  - Er^{68} *M*IV and *M*V edges 3552
  - $K\alpha_1$ lines, width 5452*
  - *K*-limit for Sb 7001
  - Al absorption in soft region 8761
  - in molecules, theory 9513–15
  - "jump" at *K*-edge, theory 9516
- **emission**
  - Al and Mg in alloys, *K*-emission discontinuities 1085
  - RaD *L*-radiation 3744
  - RaD $\rightarrow$ Ra*F*, *L*-radiation 3745
  - *L* spectra from transuranium elements decay 3750
  - Pt *L*-spectrum spin doublets 4413
  - Os^{185} *K* capture 7217
  - *K*-series, Mn^{25}, Zn^{30} and Ge^{32}, fine struct. 7927

X-ray spectra—*contd.*
- **emission**—*contd.*
  - **continuous**
    - 322-MeV electrons on Pt 3551

X-ray spectrometers see also *Gamma-ray spectrometers*
- double-crystal, 3–15 Å, suitable crystals 4904
- high resolving-power curved-crystal 5450
- G.M. counter, automatic recording 7000
- double-crystal, automatic focusing condition 8347
- microbeam 8348
- double crystal, for small-angle scatt. 9020

X-ray spectroscopy
- new *h*/*e* evaluation 2357
- bent-crystal spectrochem. 4411
- bent-crystal, appl. 4412
- bent-crystal technique 4419
- tissue and cell structure det. 7926

X-ray tubes
- 1000 kV, Be-window 1090
- automatic current-stabilization circuit 1091
- 1-MV reson. cavity type 1092
- conference report 2722
- triple-tube combination 2724
- fine beam 3566
- heat distrib. in target 4014
- gas insulation 4015
- h.v., 1040-keV directional dist. 4420
- micro-beam, high intensity 6252
- demountable, cathode centring 7003
- high-brilliance diffraction tubes 7931
- "flash" tube, conical anode, circular cathode 9882

X-rays see also *Nuclear reactions, photons*; *Radiation protection*
- meson production 641
- living cell reactions, theory 768
- *h*/*e* precision evaluation 1084
- from 322-MeV synchrotron, Pb cascade showers study 1095
- nuclei acids degradation 1434
- induced absorption bands, MgO crystals 1746
- effect on very l.p. gas discharge 1861
- π^+-meson prodn., rel to *Z* 2062
- H$_2$O$_2$ production, irradiated water 2134
- effects on NaCl : Pb phosphor optical props. 2559
- high-intensity beams, conference 2722
- polarized, high-energy, production 4418
- effects on biological systems 4973
- from h.f.-excited As vapour 5448
- penetration and diffusion, spatial distrib. calc. 5449
- X-ray bremsstrahlung spatial distrib. 5467
- colour centre prod. in quartz 6558
- soft, in biol. assay 6655
- transmission through many layers, resultant 6999
- X-ray microscope 7002
- thin target bremsstrahlung, ang. distrib. 7020
- bremsstrahlung from thin Au 7278
- 322 MeV, no meson production 7295
- penetration, diffusion in ∞ homogeneous medium 7929
- in solar radiation 9209
- high-energy, H$_2$O$_2$ decomp. 9772
- effect on retina 9866
- glasses transparent to X-rays 9887
- quantum yield of photo films 9900
- **protection** see *Radiation protection*

Xenon
- neutron scattering cross-section 1328
- vapour pressure 2435
- compact arc lamp 6162
- crystal, triple-dipole interaction 6373

Zeeman effect
- H atom 554
- cm waves 951
- absence of light beats 990
- levels in NO, hyperfine structure 1724
- energy levels in O$_2$, calc. 1960
- OCS$^{33}J = 1 \rightarrow 2$, h.f.s. 2923
- Ta I 3430
- *g*-factor variations, Paschen–Back effect 3711
- He discharges forbidden lines 4243
- magnetic resonance study, optical methods 7139
- microwave, molec. and nucl. mag. moments det. 7155

Zeeman effect—*contd.*
  Eu and Nd salts solutions 7739
  g-values for K and H 8145
  electron anomalous spin gyromag. ratio 8146
  Mn I 9367
Zeta-potential
  in symmetrical electrolyte, calc. 332
  from cataphoretic velocities 1067
  hydrophobic sols 1444
  phosphors, rel. to adhesion 1753
Zinc
  viscosity 43°C to 480°C 109
  de Haas–van Alphen effect 488
  diffusion rate in Cu 659
  volume diffusion, frequency factor and activation energy 660
  stress-strain curves 665
  contact potential time variation 1032
  rupture mechanism 1366
  diffusion in Ag–Zn alloys 2079
  brittle failure 2108
  friction, strength, hardness 4°–600°K 3107, 6519
  diffusion coeff. in Hg 3180
  evapd. layers, elect. microscope exam. 3810
  crystals, light figures 4889
  light-figure orientation det. 4890
  alloys with Sb, barrier layers 5404
  vapour pressure 300–360°C 6171
  critical mag. field 6979
Zinc—*contd.*
  electrodes, prep. by sublimation 8297
  foil, oxidation kinetics 9056
Zinc blende
  elastic consts. from X-ray scatt. 3820
Zinc fluoride
  solid soln., paramagnetic susceptibility 495
Zinc oxide
  electrical conductivity and surface activity 1056
  semiconductor, elec. props. 6963
  elec. and opt. props. 7867
  smoke particles morphology 8254
Zinc sulphide
  Cu-activated luminescence, oxidation colour effect 967
  phosphors, luminescence and trapping 1752
  piezo-electric const. calc. 5398
  evap. films, study 5818
  comparison of photocond. and luminescence 6886
Zincite
  volume rectification 8735
Zirconium
  Zr–Hf mixtures, spectrochem. analysis 2152
  vapour pressure, 1949–2054°K 3488
  examination under polarized light 4302
  permeability to H 7302
Zirconium hydroxide
  gels, opt. props. 8309
Zoology
  bird navigation 6656

COLLECTED LIST OF SUBJECT INDEX HEADINGS

(EXCLUDING NAMES OF SUBSTANCES)

Headings followed by † were not used in 1951

MATHEMATICS

- Algebra
- Equations
- Polynomials
- Geometry
- Transforms
- Vectors
- Tensors
- Matrices

- Transformations

- Series
- Fourier analysis
- Fourier series†

- Functions
- Space, functional†
- Mathieu functions
- Bessel functions

- Calculus
- Differential equations
  - relaxation methods
- Integrals
- Integral equations
- Fourier integrals†
- Calculation
- Interpolation
- Tables, mathematical
- Nomograms

- Graphs
- Calculating apparatus
  - analogue apparatus
  - differential analysers
  - digital computers
- Sliderules

- Probability
- Random functions
- Fluctuations
- Errors, theory
- Statistical analysis
  - applications, counters

- Group theory†

ASTRONOMY. ASTROPHYSICS. GEODESY

- Astronomical observations
- Astronomical instruments
- Errors
- Telescopes
- Celestial mechanics

- Cosmogony
- Cosmology
- Interstellar matter
- Cosmic radiations, radio-frequency
- Cosmic rays

- Solar system
- Eclipses
- Orbits
- Planets
- Earth
- Moon
- Meteors
- Comets

- Sun
  - magnetism
  - radiation
    - radio-frequency
- Sunspots
- Prominences
- Corona

- Stars
  - magnetism
  - magnitudes
  - radiation
- Novae
- Variable stars
- Binary stars
- Multiple stars
- Stellar clusters
- Stellar motion
- Parallax
- Nebulae
- Galaxies

- Milky Way
- Astronautics
- Rockets

- Astronomical spectra
- Stellar structure
- Stellar composition
- Thermonuclear reactions
- Elements
  - origin
  - relative abundances

GEODESY

- Geodesy
- Earth
  - rotation
- Gravity
- Photogrammetry
- Cartography†
- Navigation
- Time measurement

PHYSICS

- Physics
- Teaching
- Bibliographies
- Collections of physical data
- Units
- Constants
- Dimensions
- Equations, dimensional

- Errors, theory
- Measurement
- Standards
- Laboratories
- Laboratory apparatus
- Instruments
- Scales, instrument
- Recording

FUNDAMENTALS

- Relativity
  - general
  - kinematical
  - special
  - unified field
- Gravitation

- Quantum theory
  - applications
  - radiation
  - *S*-matrix theory
  - spinor equations
  - wave mechanics
- Fundamental particles
- Photons

- Nuclear forces
- Collision processes
- Scattering, particles
- Constants, atomic
- Electron theory
- Field theory
  - electromagnetic field
  - interactions
    - meson-nucleon
    - particle/e.m. field
  - meson field
  - quantization
- Radiation, theory

- Statistical mechanics
- Indeterminacy
- Random processes
- Fluctuations
- Brownian movement
- Thermodynamics

GENERAL MECHANICS. MECHANICS OF SOLIDS

- Mechanics
- Kinematics
- Stress analysis
- Bending
- Bending moments†
- Buckling†
- Torsion
- Gravitation
- Pendulums
- Pressure

- Dynamics
  - flexible bodies
  - rigid bodies
- Velocity
- Acceleration†
- Coriolis forces
- Vibrations
- Vibrating bodies
- Damping
- Relaxation

- Rotating bodies
- Centrifuges
- Gyroscopes
- Ballistics
- Rockets
- Impact
- Friction

MECHANICAL MEASUREMENTS

- Mechanical measurements
- Length measurement
- Altimeters
- Length standards
- Micrometry
- Interferometry
- Thickness measurement
- Optical lever†
- Curvature measurement
- Particle size
- Area measurement
- Surface measurement
- Volume measurement†

COLLECTED LIST OF SUBJECT INDEX HEADINGS

Weighing
Mass standards
Balances
Density
Density measurement
Vapour pressure measurement
Angle measurement
Alignment
Angular velocity measurement†
Stroboscopes
Velocity measurement†
Acceleration measurement
Time measurement
Time interval measurement

Manometers
Anemometers
Pressure measurement
Force measurement
Torquemeters†
Dynamometers
Strain gauges

MECHANICS OF FLUIDS

Hydrostatics
Density
Pressure
Elasticity, liquids
Compressibility
Hydrodynamics
  solid bodies in liquids
Viscosity
Viscosimeters
Superfluidity
Flow
Flowmeters
Pumps
Double refraction, flow
Turbulence
Vortices
Cavitation
Jets
Sprays
Lubrication
Diffusion
  thermal
Liquid waves
  surface
Liquid oscillations
Supercooling

CAPILLARITY

Capillarity†
Surface energy
Surface tension
Surface tension measurement
Contact angle
Wetting
Heat of wetting
Bubbles
Foams
Emulsions
Films, liquid
Drops
Moisture

MOLECULAR THEORY OF LIQUIDS

Liquids
  structure
  theory
Equations of state
Association
Diffusion
  thermal
Osmotic pressure
Membranes
Filters
Solutions
Solubility
Heat of solution
Solid solutions
Liquid helium
Liquid crystals

GASES

Compressibility
Diffusion
  thermal
Viscosity
Density
Pressure
Conductivity, thermal
Vapour pressure
Vaporization
Association
Condensation
Liquefaction
Humidity
Moisture
Hygrometers

Aerodynamics
Aerofoils
Flow
Flowmeters
Supersonic flow
Turbulence
Jets
Anemometers

Manometers
Barometers
Vacuum apparatus
Vacuum gauges
Vacuum pumps
Vacuum technique

MOLECULAR THEORY OF GASES

Kinetic theory
Collision processes
Molecules
Statistical mechanics
Association
Equations of state
Joule–Thomson effect†

VIBRATIONS. ACOUSTICS

Vibrations
  excitation
  measurement
Waves
Seismographs
Vibrating bodies
Oscillations
Liquid oscillations
Piezoelectric oscillations
Damping
Relaxation

Acoustics
  musical
Acoustic waves
Acoustic wave propagation
Schlieren systems
Liquid helium, sound propagation
Döppler effect
Reflection
Refraction
Scattering
Interference
Interferometers
Interferometry
Diffraction
Absorption
Transmission

Elastic waves
Liquid waves
Seismic waves
Shock waves
Ultrasonics

Acoustic generators
Acoustic radiators
Acoustic transducers
Microphones
Hearing aids

Acoustic impedance
Acoustic analysis
Scales, musical
Beats
Resonators
Bells†
Tuning forks

Acoustical measurements
Acoustical laboratories
Intensity measurement
Flames, sensitive†
Stroboscopes
Velocity
Chemical effects

Musical instruments
Sound recording
Sound reproduction
Speech
Hearing
Ear

Atmospheric acoustics
Sound ranging
Architectural acoustics
Reverberation
Echo
Noise
Noise abatement

OPTICS. RADIATION

Light, electromagnetic theory
Photons
Light sources
Velocity
Döppler effect
Beats
Photoelectricity
Radiation
  theory
Radiation pressure
Photophoresis
Radiation detectors
Bolometers
Thermopiles
Pyrometers
Emissivity

Photometry
  light sources
Photometers
Illumination
Brightness
Spectrophotometry
Spectrophotometers
Densitometry

Optics, geometrical
Reflection
Mirrors
Optical lever†
Optical images
Aberrations, optical
Resolving power
Lenses
  aspherical
  photographic
Prisms
Refraction
Refractive index
Refractive index measurement
Dispersion
Refractometers
Optical systems
Optical materials
Optical instrument testing
Schlieren systems

Spectroscopy
  light sources
Monochromators

COLLECTED LIST OF SUBJECT INDEX HEADINGS

Spectrometers
  accessories
  microwave
Spectrophotometry
Spectrophotometers
Spectra
Raman spectra
Stark effect
Zeeman effect
Spectral line breadth
Döppler effect
Spectrochemical analysis
Temperature measurement
  spectral methods
Astronomical spectra
Night sky
Atmospheric optics

Absorption
Transmision
Transparency
Pleochroism
Filters

Luminescence
Luminescence spectra
Fluorescent screens

Reflection
Reflectivity
Optical films

Interference
Interference fringes
Interferometry
Interferometers
Diffraction
Diffraction gratings
Scattering
Diffusion

Polarized light
Double refraction
  electric, flow, magnetic
Optical rotation
Magneto-optical effects
Polarimeters
Photoelasticity
Colour
  theory
Colorimetry
Colour centres
Colorimeters
Vision
Colour vision
Stereoscopy
Visibility

Optical instruments
Optical instrument testing
Optical materials
Glass
Telescopes
Microscopes
  phase contrast
  reflecting
Microscopy
Mirrors
Light sources
Projectors

HEAT

Heat
Thermal measurements
Heat conduction
Conductivity, thermal
Heat transfer
Heat losses†
Heat insulation
Temperature distribution
Radiation
Emissivity
Convection
Heating
Cooling
Diffusion, thermal
Thermal expansion
Thermal transformations
Phase transformations
Heat of transformation†
Freezing
Supercooling
Melting
Melting point
Heat of fusion
Boiling
Boiling point
Vaporization
Evaporation
Distillation
Heat of vaporization
Vapour pressure
Vapour pressure measurement
Humidity
Sublimation
Heat of sublimation
Condensation
Critical constants
Heat of wetting

Flames
Combustion
Heat of combustion

Low-temperature phenomena
Superconductivity
Superfluidity
Liquid helium
  sound propagation
Low-temperature production
Low-temperature technique
Liquefaction, gases
Joule–Thomson effect†

Temperature
Temperature measurement
Pyrometers
Thermometers
  resistance
Thermostats
Thermocouples
Thermopiles

Calorimetry
Heat capacity
Specific heat
Heat of dissociation
Latent heat

THERMODYNAMICS

Thermodynamics
  applications
Thermodynamic properties
Thermodynamic potential
Entropy
Equations of state
Joule–Thomson effect†

ELECTRICITY

Electricity
Electrical measurements
Units, electrical
Electrons
Electron theory
Fluctuations, electrical

ELECTROSTATICS. DIELECTRICS

Electrostatics
Electric fields
Electric charge
Space charge
Contact potential

Dielectrics
  measurement
  theory
Dielectric properties
  ferro-electrics
Hysteresis
Relaxation
Electric strength
Piezoelectricity
Piezoelectric oscillations
Electrostriction
Electro-optical effects
Double refraction, electrical

ELECTRIC CONDUCTION. CURRENTS

Conduction
Conductivity
Resistance
Contact resistance
Current
Fluctuations, electrical
Skin effect†
Semiconductors
Rectifiers
Superconductivity
Photoelectricity
Photoconductivity
Photovoltaic effects

Thermoelectricity
Thermocouples
Thermopiles
Electrokinetic effects
Electrophoresis
Zeta potential

ELECTRIC DISCHARGES

Discharges
  high-frequency
Breakdown, electric
Arcs
Sparks
Lightning
Corona

X-RAYS

X-rays
X-ray measurement
Radiation monitoring
X-ray absorption
Radiation protection
X-ray diffraction
X-ray reflection
X-ray scattering
Compton effect
X-ray spectra
X-ray spectrometers
X-ray spectroscopy
X-ray monochromators
X-ray tubes
X-ray crystallography
X-ray examination of materials
Radiography
  accessories
  microradiography

CATHODE RAYS. POSITIVE RAYS

Electron beams
  absorption
  ionization†
Electrons
  radiation
  scattering
Electron diffraction
Electron optics
Electron microscopy
Electron microscopes
Electron tubes
Electron emission
  secondary
Ion beams
  focusing
Ion microscopes†
Ion sources
Mass spectrometers
  accessories
  applications

- Particle accelerators
  - linear
  - orbital

DISCHARGE TUBES. COUNTERS

- Gas discharge tubes†
- Electron tubes
- Space charge
- Counters
  - crystal
  - scintillation
  - operation technique
- Counter tubes
  - construction
  - discharge mechanism
  - operation technique
  - special applications
- Counter tubes, accessories
- Statistical analysis, counters
- Counting circuits
- Ionization chambers
- Cloud chambers
- Photography, particle tracks

IONIZATION. THERMIONICS

- Ions
  - recombination
- Ion velocity
- Ionization
- Ionization potential
- Dissociation

- Thermionic emission
- Ionization, surface
- Cathodes
- Work function
- Fluctuations, electrical

COSMIC RAYS

- Cosmic rays
  - absorption
  - apparatus
  - composition
  - alpha-particles
  - electrons
  - mesons
  - neutrons
  - photons
  - protons
  - effects
  - origin
  - showers and bursts
  - variations

MAGNETISM

- Magnetism
- Ferromagnetism
  - theory
- Paramagnetism
- Diamagnetism
- Magnets
- Compasses†
- Magnetic fields
- Magnetic field measurement
- Magnetic circuit†
- Magnetization
- Demagnetization
- Gyromagnetic effect
- Magnetic hysteresis, relaxation
- Magnetic measurements
- Magnetic properties of substances
- Paramagnetic resonance absorption
- Nuclear magnetic resonance

ELECTROMAGNETISM. ELECTRODYNAMICS

- Electrodynamics
- Electromagnetism
- Electromotive force
- Inductance†
- Eddy currents
- Field theory
- Light, electromagnetic theory
- Electromagnetic wave propagation
  - atmosphere
  - ionosphere
  - waveguides
- Electromagnetic waves
  - radiators
- Diffraction
- Reflection
- Refraction
- Scattering
- Absorption
- Electromagnetic oscillations
- Spectra, r.f.
- Spectrometers, microwave
- Interferometers
- Interferometry
- Cosmic radiations, r.f.
- Sun, radiation, r.f.
- Radiation, theory

MAGNETIC EFFECTS

- Magnetoelectric effects
- Hall effect
- Magnetomechanical effects
- Gyromagnetic effect
- Magnetostriction
- Magneto-optical effects
- Double refraction, magnetic
- Magnetothermal effects
- Magnetochemistry
- Zeeman effect
- Terrestrial magnetism

THEORY OF SOLID STATE

- Solids, theory
- Crystals, lattice dynamics
- Quantum theory

MOLECULAR STRUCTURE

- Molecules
  - dimensions
  - dissociation
  - excitation
  - internal mechanics
    - energy levels
    - nuclear coupling
  - moments
  - physical structure
  - relaxation
- Spectra
- Molecular beams
- Molecular volume
- Avogadro's number

ATOMIC STRUCTURE. NUCLEUS. ISOTOPES

- Atoms
  - excitation
  - magnetic moment
  - structure
- Constants, atomic
- Atomic beams
- Ionization potential
- Nucleus
  - electric moment
  - energy levels
  - magnetic moment
  - spin
  - theory
- Nuclear excitation
- Nuclear magnetic resonance
- Spin-lattice coupling
- Nuclear forces
  - scattering
- Nuclear isomer separation†

- Atomic mass
- Atomic volume†
- Elements
  - origin
  - relative abundances
- Periodic system
- Isotopes
  - detection
  - relative abundance
- Mass spectra
- Isotope separation
- Mass spectrometers
  - accessories
  - application
- Tracers

RADIOACTIVITY. α-, β-, γ-RAYS

- Radioactivity
  - artificial production
  - decay periods
  - decay schemes
  - electron capture
- Radioactive disintegration theory
- Radioactivity measurement
- Radioactive tracers
- Radiation protection
- Radiation monitoring

- Alpha-rays
  - absorption
  - angular distribution
  - detection, measurement
  - effects
  - scattering
- Alpha-ray spectra
- Alpha-ray spectrometers
- Beta-rays
  - absorption
  - measurement
  - scattering
- Beta-ray spectra
- Beta-ray spectrometers
- Gamma-rays
  - absorption
  - angular distribution
  - detection, measurement
  - effects
  - internal conversion
  - scattering
- Gamma-ray spectra
- Gamma-ray spectrometers
- Electron pairs
- Electron annihilation

NUCLEAR REACTIONS

- Nuclear excitation
- Nuclear isomer separation†
- Nuclear forces
  - scattering
- Nuclear reactions
- Nuclear reactions, chemical effects
- Thermonuclear reactions
- Nuclear fission
  - products
- Nuclear fission reactors

- Counters
- Ionization chambers
- Cloud chambers
- Photography, particle tracks
- Collision processes
- Radiochemistry
- Chemical effects of radiations
- Biological effects of radiations
- Radiation monitoring
- Radiation protection

ATOM AND MOLECULE BEAMS. MESONS. NEUTRONS

- Atomic beams
- Molecular beams
- Fundamental particles
- Scattering
- Particle accelerators

COLLECTED LIST OF SUBJECT INDEX HEADINGS

- Neutrons
  - absorption
  - detection
  - diffusion
  - polarization
  - production
  - reflection
  - refraction
  - scattering
    - proton-neutron
- Neutron diffraction
- Neutron spectrometers
- Neutrino

- Mesons
  - absorption
  - decay
  - detection
  - mass
  - production
  - scattering
- Field theory, meson field
- Protons
  - absorption
  - angular distribution
  - magnetic moment
  - negative
  - production
  - scattering
- Proton spectra
- Deuterons
  - scattering
- Tritons

- Electrons
  - radiation
  - scattering
- Electron theory
- Electron pairs
- Electron annihilation

STRUCTURE OF SOLIDS

- Solids
  - structure
  - theory
- Density
- Plasticity
- Surface texture
- Fracture
- Brittleness
- Vitreous state
- Powders
- Granular structure
- Particle size
- Surface measurement
- Sintering
- Fibres
- Porosity
- Permeability
- Membranes
- Swelling
- Diffusion, solids
- Films, solid
- Solid solutions
- Electron diffraction examination
- Electron microscope examination
- X-ray examination of materials

ELASTICITY. STRENGTH. RHEOLOGY

- Elasticity
- Elastodynamics
- Elastic constants
- Photoelasticity
- Stress/strain relations
- Strain gauges
- Elastic limit
- Elastic losses
- Elastic deformation
- Plastic deformation
- Plastic flow
- Plasticity
- Slip
- Compressibility
- Elastic fatigue
- Elastic relaxation
- Hysteresis
- Creep
- Mechanical strength
- Breaking strength
- Fracture
- Brittleness
- Adhesion
- Abrasion
- Hardness
- Work hardening
- Heat treatment
- Cold working
- Stresses, internal

- Rheology
- High-pressure effects
- Friction

PHYSICAL CHEMISTRY

- Phase equilibrium

- Exchanges, chemical
- Reaction kinetics
- Reaction rates
- Chemical reactions
- Heat of reaction
- Explosions
- Detonation
- Combustion
- Heat of combustion
- Catalysis
- Catalysts

- Electrochemistry
  - electrodes
- Electrolysis
  - electrodes
- Conductivity, electrolytic
- Ions, electrolytic
- Ion velocity, electrolytic
- Electrodeposition
- Dissociation
- Heat of dissociation
- *p*H

- Chemical effects of radiations
- Photochemistry
- Nuclear reactions, chemical effects
- Colloids
- Thixotropy

- Sols
- Gels
- Emulsions
- Suspensions
- Aerosols
- Foams
- Particle size
- Centrifuges
- Sedimentation, colloids
- Filters†

- Adsorption
- Adsorbed layers
- Heat of adsorption
- Chromatography
- Phase transformations

- Atomic weight
- Molecular weight
- Molecular weight determination
- Atomic volume†
- Molecular volume
- Avogadro's number
- Periodic system
- Elements
  - chemical properties
  - origin
  - relative abundances
- Bonds
- Valency
- Chemical structure
  - optical, magnetic, etc., effects

- Stereochemistry
- Magnetochemistry
- Polymers
- Polymerization
- Isomerism
- Isomerization

- Laboratory apparatus
- Pumps
- Disillation
- Filters†
- Chemical reactions
- Chemical technology
- Oxidation
- Combustion
- Dissociation
- Explosions
- Detonation

- Chemical analysis
  - adsorption
  - conductimetric
  - polarographic
  - positive rays
  - radioactive
  - X-rays
- Spectrochemical analysis
- Tracers
- Radioactive tracers
- Radiochemistry

CRYSTALLOGRAPHY

- Crystallography
  - mathematical
- Crystals
  - electron states
  - etching
  - faces
  - growth
  - imperfections
  - lattice dynamics
  - orientation
  - twinning
- Liquid crystals

- Crystal chemistry
- Crystal properties
  - electrical
  - magnetic
  - magneto-optic†
  - mechanical
  - optical
  - thermal
- Colour centres
- Counters, crystal
- Crystallization
- Heat of crystallization†
- Polymorphism

- Crystal structure
  - molecular
- X-ray crystallography
  - analytical methods
  - apparatus
  - technique
- X-ray examination of materials
- Electron diffraction crystallography
- Electron diffraction examination
- Electron microscope examination
- Neutron diffraction crystallography
- Mineralogy

GEOPHYSICS

- Geophysics
- Geodesy
- Gravity

- Seismology
- Seismic waves
- Seismographs
- Microseisms

- Terrestrial electricity
- Terrestrial magnetism
- Compasses†
- Magnetic storms

- Earth
  - age
  - composition
  - heat
  - rotation
- Geophysical prospecting

- Oceanography
- Tides
- Seawater
- Rivers
- Glaciers

ATMOSPHERE. METEOROLOGY

- Meteorological instruments
- Hygrometers
- Anemometers
- Barometers
- Weather forecasting

- Atmosphere
  - composition
  - humidity
  - movements
  - structure
  - temperature
  - thermodynamics
- Atmospheric pressure
- Humidity
- Ionosphere
- Ionosphere measuring apparatus
- Ionization, atmosphere
- Atmospheric disturbances
- Thunderstorms
- Magnetic storms

- Sunlight
- Sky brightness

- Wind
- Clouds

- Snow
- Ice
- Rain
- Rainfall
- Fog
- Condensation
- Evaporation
- Climatology

- Atmospheric optics
- Visibility
- Night sky
- Twilight
- Atmospheric electricity
- Aurora
- Lightning
- Atmospheric acoustics

BIOLOGY

- Biology
- Biophysics
- Biological technique and instruments
- Electrobiology
- Biological effects of radiations
- Zoology
- Physiology
- Viruses

- Blood
- Vision
- Colour vision
- Eye
- Hearing
- Ear
- Speech

MEDICAL SCIENCE

- Medical science
- Pathology
- Electrotherapy
- Radiotherapy
- Radiography
- Hygiene
- Radiation protection

PHOTOGRAPHY

- Photography
  - applications
  - colour
  - high-speed
  - infra-red
  - particle tracks
- Lenses, photographic

- Cameras
- Photographic light sources
- Photographic materials
  - sensitivity
- Photographic process
  - development

- Photogrammetry
- Densitometry
- Radiography
  - accessories
  - microradiography
- Cinematography
  - high-speed

MATERIALS

- Water
- Ice
- Glass
- Glass-metal seals
- Optical materials

- Ceramics
- Fibres
- Paper
- Rubber
- Plastics

- Metallurgy
- Metals
- Alloys